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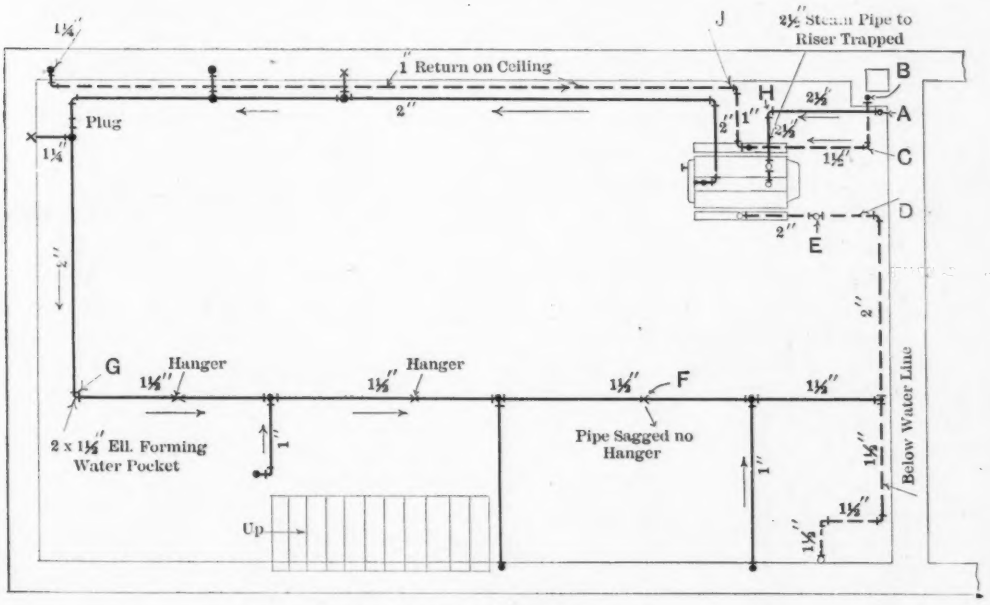
OVERHAULING A STEAM JOB

BY "JONES"

I had occasion a few months ago to look over a steam heating job that did not work, in the interest of the boiler manufacturers, the capacity of whose goods was called in question, to see what was wrong and how it could be quickly and cheaply set right.

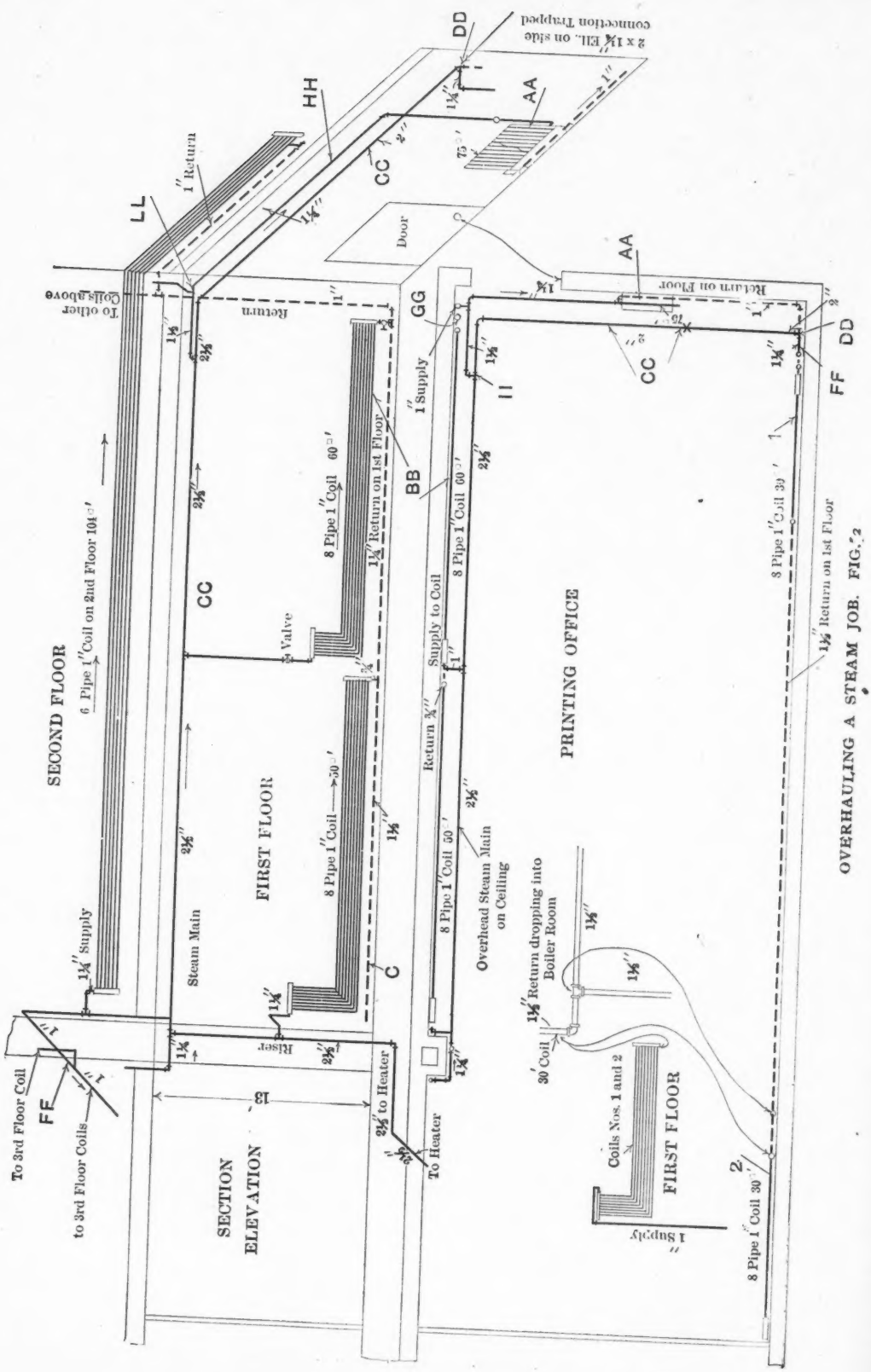


OVERHAULING A STEAM JOB. FIG. 1

What I found was a three-story building in a moderate sized Illinois town. The building was used as a printing shop and the rear half of it was unexcavated, leaving a foundation for large printing presses. Under the front half was a cellar 7 feet high.

There were about 1,200 feet of radiation in the building, including mains, and this radiation was supplied by a boiler having a capacity of a little less than 1,100 feet. This I did not regard as necessarily serious because I have seen many boilers that would carry more than their scheduled load, and of course we have all encountered cases where a little more radiation was specified than the building really required. In this instance, I had confidence in the boiler, which I found favorably located, very near to a chimney which had an adequate flue, giving good draft.

The chief defects seemed to be in the piping. These were pretty seri-



OVERHAULING A STEAM JOB. FIG. 2

ous, as the following explanation and the accompanying drawings will show:

I found that there were two different heating systems taken off from the boiler; one of them a one-pipe system taking care of the front part of the building, and the other a two-pipe system for heating the rear portion.

The one-pipe system in the front is supplied by a 2-inch main running around the cellar. I found that where the main runs across the front of the building there was a fall of possibly a quarter of an inch in 13 feet, and at the point marked G, Fig. 1, where the pipe is reduced from 2 inches to 1½ inches, it was done by a reducing elbow which, being taken off the side, formed a water pocket. I remedied this by turning the elbow down 45 degrees and putting in a close nipple and another 45 degree elbow, thus relieving the water pocket at that point.

At the point marked "F" there was another water pocket, but that was simply due to the absence of a pipe hanger. I put on a hanger and pulled the pipe up into line.

The cellar system was without any equalizing connection until the steam had traveled 100 feet.

The two-pipe system heating the back portion of the building is supplied by a 2½-inch line from the boiler, the riser going up near the chimney to the first floor ceiling, about 14 feet above the top drum of the boiler. From that point a 2½-inch horizontal line is carried along the first floor ceiling.

The riser continues up, alongside the chimney, to the ceiling of the second story, supplying a 104-foot coil on the second floor and terminating in a one-inch horizontal main supplying two coils on the third floor.

This horizontal line was trapped one or two inches but was readily changed.

I found that as the 2½-inch pipe left the boiler it pitched downward to the point marked H, from which it rose so that there was left a water pocket at H. This was caused by a crooked fitting at the boiler, making the pipe pitch downward. I remedied this by changing the fitting and left a continuous pitch toward the boiler from the riser at the point A.

As this 2½-inch pipe had to be taken down anyway, I substituted a 3-inch pipe, graded upward from the boiler to the riser beside the chimney and at that point, B, put on a 2½ by 2 by 3-inch tee using the 2-inch opening as a drip, dropping from there down below the water line of the boiler.

At the point A there was also a 1-inch return pipe entering the side of the drum. This I disconnected, carried it along the wall and connected it into the 2-inch line, dropping below the water line at B.

The return pipe B also entered the boiler separately and was perhaps the most important cause of all the trouble. I disconnected this from the boiler and dropped it down into the 2-inch pipe below the water line, connecting it at the point D. All the connections are now below the water line and the former 2-inch return pipe E I increased to 2½ as far as the point D.

On this 2½-inch return, I placed at E a swinging check valve. I wish to go on record right here that I never recommend a check on any kind of a thoroughly first-class one-pipe job, but in this case, with a combination of one-pipe and two-pipe work, and with dry returns on the two-pipe work, I consider the check valve necessary.

Now, such valves are usually set vertically, but when we have such long returns and practically dry returns, it is necessary to overcome as far as possible the weight of the flapper of the valve. In order to do this, I set the valve on an angle of about 45 degrees instead of setting it vertically, thus overcoming to some extent the weight of the flapper of the valve so that less weight of water would open it.

The 2½-inch horizontal pipe CC (Fig. 2), was carried along the first floor ceiling to the extreme rear of the building without any relief. At

the rear end it was reduced to 2 inches by an elbow that somewhat trapped the line at that point, as explained in regard to the connection G. Then it extended along the back of the building, still close to the first floor ceiling, and then it was reduced to 1¼ inch, trapping the line again and a little worse than before. At this point the 1¼-inch steam pipe is relieved into the dry return at FF.

The radiator, AA, is supplied by a 1¼-inch pipe, HH, taken from the top of the 2½-inch steam main, CC, and running along the ceiling above CC, pitching toward the radiator. Just above the radiator a valve is placed, in order to shut off the supply of that radiator; but this line, HH, supplied risers to other stories so that when the first-floor tenants shut off the 75-foot radiator, AA, water would accumulate in the main, HH, and in the drop connection leading to the radiator, robbing the boiler of just that much water and shutting off the circulation from the riser, LL.

All the returns of this two-pipe system were practically lying on the floor at a dead level, and in some cases I think they are trapped, but not seriously. They were under printing presses and type cases and hard to get at even for inspection. I left them as they were because of the great difficulty and expense in changing them.

I broke the 2½ by 2-inch elbow connection at the ceiling at the point EE, and inserted a 2½ by 2-inch tee into which I connected the 2-inch line CC. From the opening left at EE I inserted a 2½-inch nipple with a 2½ by 1¼-inch elbow looking down and connected this 1¼-inch opening into the return at the point GG. This is intended to equalize the dry return connection so as to prevent the boiler pressure from backing up into the return as it had previously been doing.

In making these changes, I cut out the 1¼-inch supply line HH to the radiator AA, and took off a connection directly from the top of the steam main at CC, dropping from thence to the radiator. That allows the 1¼-inch connection shown at LL to be dropped back on the steam main, thus doing away with the water pocket, formed when the radiator AA was shut off.

I also disconnected the piping at DD so that instead of forming a pocket as it did when reduced from 2 inches to 1¼ I turned the elbow downward and then carried the line across, leaving the connections as they were, but having relieved the water pocket.

This system seemed to be sufficiently equalized, so far as a steady water line is concerned, up to 3 pounds pressure, but when the pressure was raised beyond 3 pounds the water left the boiler, as was quite natural; then it backed up into the return pipe, flooded the coils and the piping system.

One of the second-floor coils has 104 square feet of surface supplied by a 1¼-inch connection, returning by a 1-inch connection into a 1-inch pipe. This 1-inch return pipe also takes the condensation from other coils on the third floor, so that only one result could be looked for.

I placed swinging check valves on the returns from the large coils, setting them at an angle of 45 degrees as previously explained, in order to prevent the live steam from the dry returns and also the water of condensation from rushing into the return end of the coils, the connections being so short from the return pipe that when the air valves were open, water would get into the coils ahead of the steam and prevent circulation.

The return connections to all of the large coils were entirely too small. For example, the 50-foot wall coil on the first floor was supplied by a 1¼-inch steam connection with a ¾-inch return. The 60-foot coil had a 1-inch steam connection with a ¾-inch return.

All of the work described above was done in less than five days, and while it could not be said to have resulted in a job that anybody would call strictly first class, it did prevent the flooding of the returns and the

coils, the boiler does maintain a reasonably steady water line and there is circulation throughout the system and the building is heated. It could be heated with less attention and less fuel consumption, but as the boiler was more than 10 per cent. deficient in capacity, based on its advertised rating, and as some of the defects could only be remedied at an unreasonable expense, I consider it a fair example of a job remedied from a faulty installation.

Some of your readers may go through life without ever encountering such difficulties, but if they should come across them it would be probably interesting and possibly instructive to see how one man sought to solve the problem.

MECHANICAL VENTILATION IN 1904

By Hugh J. Barron

In the year 2004 mechanical ventilation will be different unquestionably from what it is in 1904, and what an ephemeral article should show is, what is the condition of practice today. Progress is rapid, and we all want to be in touch with its skirmish line.

The mechanical problem of shoveling vitiated air out of a box, whether that box is a hotel apartment, office structure or an assemblage room, has finally resolved itself into placing a rotary disk shovel at the exit point, minimizing power and maximizing quantity of air moved. Where architects plan their own ventilation this is not always followed; but that is another story that has been covered by Mr. R. P. Bolton, in an engineering contemporary and the only thing to do is to "forget it."

This view of ventilation is open to criticism; every view is, and particularly the tendency to ignore heating; to heat any old way or any new way. The British ventilating experts while awfully off color in that one respect, are working in the right direction, to specialize on ventilation pure and simple; and many of those natural ventilation gentlemen seem at this distance to receive an amount of architectural attention that is surprising. They may be bull headed, but they seem commercially effective and that is an admirable quality that Americans appreciate.

I may seem to imply that induction is better than plenum; that induced draft is better than forced draft. It, after all, is taking air from a combustion chamber and every specific problem no doubt requires its special treatment, but on the whole, and speaking generally, the practice today is for induced draft. It goes without saying that the air discharged must come from somewhere and that air inlets, such as doors, etc., have to be arranged in conjunction with heating stacks so as to neutralize cooling drafts, but that is a heating problem. The point near the entrance of all large stores on a cold day is unbearable unless this has been provided for. This is one of the drawbacks of exhaust ventilation, that stupidity or cussedness of the management can spoil the best plan.

Last winter I was taken by a friend to the engine room of a large office building. The work was planned by a consulting engineer and put in by one of the best contracting firms. Through complications of business, both had been superseded. A large blower was forcing cold air down on the heads of the engineers and everybody had a cold.

After looking at the blower, I told my friend that I believed the blower had been intended by the designing engineer as an exhaust fan and that it had been reversed by some one. But was the suggestion regarded with favor? Alas, no; what was wanted was criticism of the engineer and contractors by their successors in charge of the plant, and for this kind

of pure cussedness there is no practical remedy.

What is present practice in regard to quantity of vitiated air discharged from a vent exit? I think if the engineer figures on discharging 10 cubic feet per minute for each person he will have an effective ventilation and, with proper heating, will have no trouble from draughts, which is the difficulty to be avoided. It is not possible in most cases to get flue area to give a discharge of 10 cubic feet per minute, but the engineer has to do the best he can and get as near this as possible.

One of those English funny pamphlets on natural ventilation refers to the "occult qualities of air." I wonder how the "Metaphysics of Ventilation" would go, or the "The Influence of the Hegelian left on hot air." Great serious old charlatans, those natural vent fellows! Notice that $500,000 gift to promote the teaching of ventilation (wonder who got it: That is what counts in argument; there is reality.

The progress in ventilation in the last quarter century is due in the largest measure to the blower manufacturers and their advocacy of plenum heating and ventilating. There is nothing new in the present day practice of mechanical exhaust ventilation that was not known and practised 25 years ago, but the stereotyping and standardizing of the conventional agreement in practice of engineers, I think is new.

Engineers will, no doubt, say that 30 to 45 cubic feet per minute is the standard proportion that has been reached, that my 10 is an error; also that exhausting without forcing in the same quantity of air is an error, but that attitude seems grotesque to me, while to others it is quite reasonable. If certain uniform architectural problems force engineers to a uniform treatment of these problems, it seems to show that that is the way progress points, and not sporadic or eccentric practice in individual cases.

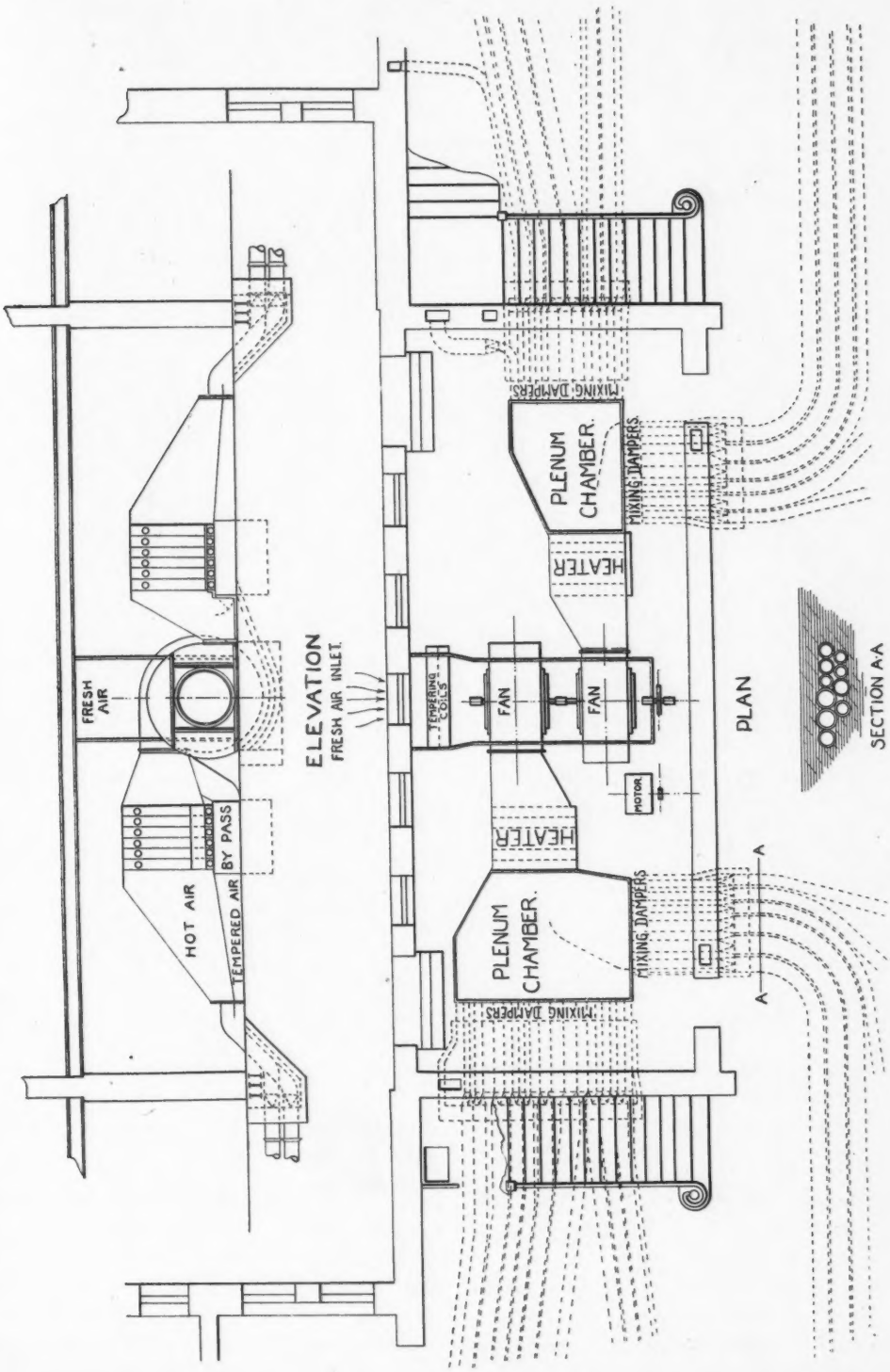
The exit fan can of course be horizontal as well as vertical or at any angle of flue, but the gain is in having no obstructed passages or enlargements of any kind to interfere with the flow of air. It would not be out of the way to say that my statements do not represent progress. I admit that it is hard to summarize present day progress of ventilation. It seems to be in the same hazy humbugged condition of any number of years back and Prof. Ewing in his Encyclopedia Brittanica article and Prof. Carpenter in his book on warming and Prof. Kent in his pocketbook all seem to summarize all the facts, up to, not their date, but up to today. The infinitesimal movement that marks progress is too small and although I have said it is rapid, I cannot do much in noting it.

Chabannes and Jomini were writing in Paris in 1804 on the progress of ventilation. The hundred years since their time has merely elaborated their concepts. Singular that through all literature there is very little reference to this subject. The historian does not know that Napoleon lost Waterloo because he slept in a poorly ventilated room; and as to our favorite authors, Scott or Thackeray, the former's heroes and heroines did not know the first principles of sanitary science, and their arrangements for living did not include ventilation and the future will not appreciate the necessarily unsanitary hero. While Becky Sharp is all right, the fact that she never had a bath militates against her spotless character.

HEATING AND VENTILATING THE ENGINEERING BUILDING AT THE OHIO STATE UNIVERSITY

One of the most interesting parts of the equipment of any building is the heating and ventilating apparatus. On this depends the comfort and health of its occupants and, in the case of a business venture, such as a theater, assembly hall or office building, the returns on the investment. In

educational institutions, the question of heating and ventilating stands pre-eminent. Everything in such instances is planned to make the conditions as favorable as possible for the greatest mental activity on the part of the students. Especially, in an engineering college of the best reputation, this equipment should be of the very highest class because it is supposed



HEATING AND VENTILATING, ENGINEERING BUILDING, OHIO STATE UNIVERSITY

not only to heat and ventilate the buildings satisfactorily, but also to serve as a model installation for the guidance of students following similar lines of work.

A fine example of such a plant is found in the Engineering Building at the Ohio State University, Columbus, Ohio. The entire building is heated and ventilated by the Buffalo Forge Company, of Buffalo, N. Y., on their plans, which were adopted in competition against those of other engineers.

The heating is by the plenum system and all the apparatus is located in the basement, with the exception of two radiators in the entrance hall. The location of the apparatus is shown in Fig. 1, and consists of two steel plate fans so arranged as to draw the air over the tempering coils. Part of this air then passes through the heater coils, the remainder flowing through a by-pass under them. At the opening of the underground ducts into the plenum chamber, the hot and tempered air are mixed in the proper proportions, these mixing dampers being controlled by an automatic system of temperature regulation. In addition to these mixing dampers are provided volume dampers, for each and every hot-air duct, so designed that they can be set and held in any desired position. Both fan wheels are mounted on the same extended shaft, the bearings for these resting on foundations entirely independent of the fan housings.

The hot air is carried through underground ducts to the base of the wall flues, through which it passes to the rooms above. These ducts are made of salt glazed tile piping and so designed that the velocity of the air will not exceed one thousand feet per minute. There is also a complete system of vent flues for carrying away the impure air. These vent flues discharge into the attic from which the air passes through ventilators to the outside. The inlets for these flues are close to the floor and the sizes and locations of all the ducts and vents can be seen on the plans.

In the recitation rooms five changes of air were provided per hour, in the laboratories four, in the offices three, in the toilet rooms on the first floor three, and in the toilet and dark room in the basement six changes. The velocity of the air in the vertical risers does not exceed a value of six hundred feet per minute in any case, and the registers have a net area so large that the air on entering the room is reduced to a velocity below four hundred feet. These inlet registers are placed eight feet above the floor line, and enameled in white which gives a very neat effect. The vent registers are seventy-five per cent. of the area of the inlet registers, are finished in yellow bronze and have no valves.

The fans provided are constructed of heavy steel plate, thoroughly braced with angle iron. The arms of the wheels are made of "T" iron and these are cast into cast-iron hubs. The paddles or "floats" of these wheels are also built of sheet steel of a heavy gauge and are braced by means of steel flanges, the floats being riveted to the arms and to the flanges. Around the periphery of these wheels is riveted a stiffening band of iron. The wheels are keyed to the shaft which rotates in ring oiling bearings.

The fans are driven by an induction motor of the polyphase type, operating on a circuit of 440 volts and 60 cycles. The speed of the fan is 180 revolutions per minute and that of the motor 1,120, the motor and fan being connected by a belt, the original installation providing for a Reynolds chain which proved unsuited to the work.

There are two heater sections, of the Buffalo miter type, one containing 2,520 actual lineal feet of pipe, the other 2,772 feet. The two tempering coils contain, together, 1,248 feet, all of one inch wrought-iron pipe. Each coil has a separate steam and drip connection and all have independent valves. The intake for the fans is provided with a screen of one inch mesh and a solid wooden shutter.

This apparatus was installed during

the spring of 1903, and on account of the capable manner in which it performed its work during the unusually severe winter of 1903-1904, is of particular interest to heating and ventilating engineers. The air in each room was changed in the time before noted and a temperature of 70° F. easily maintained. The unusual conditions which it has been able to meet satisfactorily and the reliability of the equipment as a whole stamp it as a model installation, to which not only the students can refer for precedents but also the larger fraternity of heating and ventilating engineers.

EXHAUST VENTILATION

By A Ventilating Engineer

There are many cases where even the strongest adherents of the plenum system of ventilation will concede the value of the exhaust fan, as an auxiliary, even if they will not go to the length of admitting its superiority.

At the request of the editor of The Heating and Ventilating Magazine, I furnish a sketch of a typical exhaust fan, as set up for operation.

Such a lay-out as this may be modified in almost countless ways. There may be a single exhaust pipe or there may be a dozen; these may come to the fan vertically, or horizontally, or inclined, or they may come at all varying angles and of all sizes.

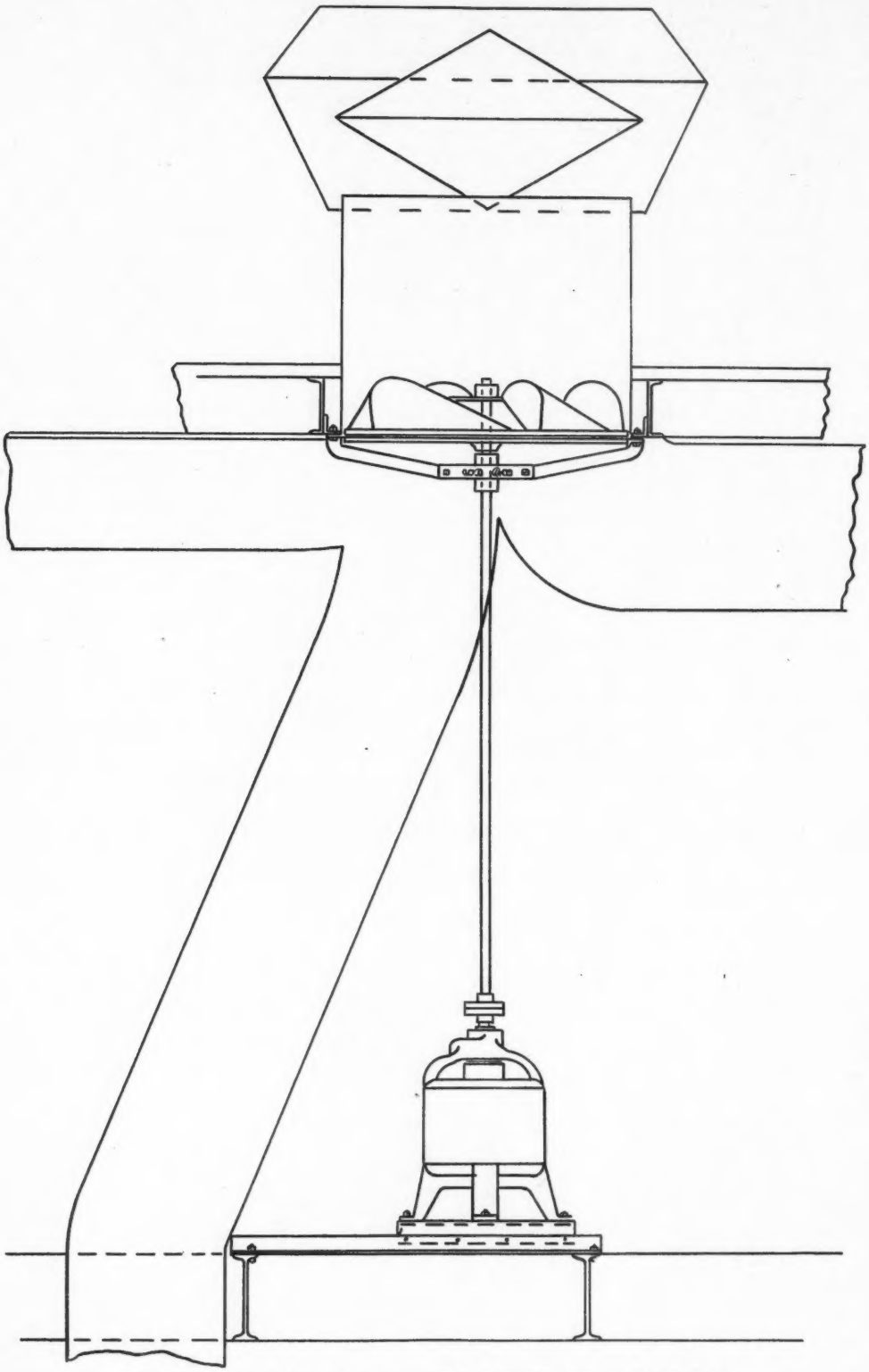
The engineering problems relate first to the connection. The drawing shows a direct-connected fan, with a comparatively long shaft. Belt connections are sometimes used, but are not in favor. The belt is sure to make some noise which the direct connection avoids, and more or less frequent attention is necessary to keep the belt properly tight. Accordingly the direct connection is most commonly employed.

The shaft may be of any length, from about 12 feet to practically nothing. As the fan is sometimes set to discharge vertically, as shown in the drawing, sometimes horizontally and sometimes at any intervening angle, so the shaft and motor may be set to correspond. Or, with the fan set to discharge vertically, a horizontal shaft may be connected by a gearing. In fact, the elasticity of the apparatus and its adaptation to such conditions as may be found to exist are almost limitless.

These, then, are among the strong points of the arrangement herewith illustrated: its adaptability to widely varying conditions and its great economy of space, especially in comparison with the old fan house.

The next engineering problem is an easier one; it is simply to calculate a fan of such size as when run at the desired speed will exhaust the quantity of air per minute that is desired to be removed. This calculation depends, of course, upon the size and length of the pipes and the straightness or crookedness of them. In other words, upon the friction in pipes, as compared with the entire absence of friction involved in drawing the air directly out of a room, with no intervening ducts.

By looking at the drawing it will readily be seen that the vacuum point is immediately below the fan. That vacuum draws equally from the discharge ends of all the pipes leading to it. Having, therefore, two pipes of equal size, from which it is required to exhaust the same quantity of air, it is apparent that if one is longer than the other, or is more crooked, or if one is vertical and the other horizontal, the one that is most favorably arranged to avoid friction will get a greater or less advantage, and will discharge more air than called for, while the one less favorably situated will discharge less air than called for, even to the point, in some cases, of not working at all.



A TYPICAL EXHAUST FAN INSTALLATION—BLACKMAN FAN

It is obviously necessary, therefore, to proportion the areas of the pipes first, to the volume of air that is expected to be drawn through them,

which is quite simple, and then comes the far more difficult problem of readjusting and revising those proportions in such a way that the friction in a long or crooked pipe will be counterbalanced by a reduction in the area of a shorter or straighter pipe.

Engineers of limited experience make no attempt at this more delicate, but essential adjustment. They resort to the very simple device of constructing all of the pipes with ample capacity and then equipping them with dampers. When the apparatus is started up it is easy to determine which pipe is doing too much work and which one too little. Then the dampers in the more favored pipes are gradually closed sufficiently to equalize the working of the entire system of piping. This method necessarily involves the furnishing of unnecessarily large pipes and the expense of fitting them with dampers.

In some cases of exceptional difficulty and unusual complications even the most experienced and capable engineers are forced to this expedient. For example, it is the practice of the New York School Board to have dampers placed on all of their pipes, because they are commonly so long and so crooked, and their proportioning involves so many exceedingly difficult calculations that it is generally found that the most elaborate designs prove more or less defective when the plant is set in operation.

Another point is the location of the fan, and the amount of work it has to do. If it has to be a large fan and is located directly over a class room, for example, the size must be so increased as to permit it to run at a reduced speed and yet perform the same work. In this case, of course, the areas of the outlet pipes must be correspondingly increased. If, on the other hand, the fan is located at a distance from occupied rooms, and from any easy sound transmission to those rooms, the fan can be run at a much higher speed, and a smaller fan and smaller ducts can be installed.

Each installation is a problem by itself and the attainment of the best results involves not only a good engineering knowledge but a considerable experience in this special branch.

THE RELATIONS OF THE ENGINEER, THE CONTRACTOR AND THE MANUFACTURER TO ONE ANOTHER

By J. H. Kinealy

In a speech made before the Society of Heating and Ventilating Engineers at its annual banquet in New York last January, when speaking of the relations which should exist between the engineer and the contractor, and the engineer and the manufacturer, I made the statement that the engineer ought to know what he wants, and that when he does know there is no trouble in getting it from the contractor; but if he does not know what he wants he is likely to get into trouble.

This statement was somewhat adversely criticized, and some of the members of the society thought that I was reflecting upon the contractor by intimating that if the engineer did not know what he wanted the contractor would be likely to give him something inferior to what the engineer really asked for and in this way work an injury to the job. I had no intention of conveying any such idea. The point which I was trying to make is one which I consider an important one. The engineer when writing his specifications should know what he wants, and his specifications should be written in such a way that they will show on the face of them that he knows what he is talking about; that he means what he says and says what he means. When an engineer writes a set of specifications and sends them out with their accompanying drawings to contractors for

bids if the drawings or the specifications contain a number of errors which evidently are due not to mistake but to ignorance on the part of the engineer, it is not to be expected that a contractor bidding upon the work will think as much of the engineer as he would if the errors were not present. And further, the contractor is at once faced with a dilemma, one horn of which means that he must deliberately make his bid with the full intent of evading the specifications, but trying at the same time to give the engineer work and material which are suitable to the conditions of the job; and the other horn means that he must bid exactly according to the requirements of the specifications with the full knowledge that these requirements are unusual and if lived up to would make the job unnecessarily expensive.

I may illustrate my meaning by one or two instances which have come under my notice. One was in the case of a piece of work involving a lot of galvanized iron work, the drawings for which showed the galvanized iron marked according to the B. & S. gauge. In such a case the question arises, What is the contractor to do? He knows that galvanized iron is not sold according to the B. & S. gauge, assuming, of course, that B. & S. stands for Brown & Sharp. He may figure the iron of a thickness corresponding to the number of the B. & S. gauge, or he may assume that the letters B. & S. were put there by mistake, and that what the engineer really meant was the Birmingham gauge. In either case the contractor has got to guess, for if he goes to the engineer he will be in a somewhat delicate position. If the contractor asks the engineer if he really means what he says the engineer is likely to say, Certainly; and is not likely to confess to such an error. If the contractor does not go to the engineer he must, in order to be safe, figure on that interpretation or correction of the error which the engineer may make, which might involve putting in the heavier iron.

In another instance, the inspector sent out by a firm of architects condemned the wiring of a building on the ground that it was not of the size specified, and after an investigation was made it was found that the inspector had used the same gauge for the electric wire that he had used for galvanized iron. Here neither the engineer nor the architect knew that there was one gauge for electric wire and another for galvanized iron.

Still another instance was where certain plans and specifications for a boiler called for a number of sheets to be used in the construction of the shell of the boiler, which was of the return fire tube type, and as the number of sheets specified was such that no sheets large enough could be bought on the market it necessitated specially rolled sheets. Here again was a case in which the contractor had to bid upon the assumption either that he would comply literally with the specifications or that he could induce the engineer to allow the use of sheets that could be bought on the market and avoid the use of specially rolled sheets. If the contractor bid with the idea of carrying out the specifications exactly as written, his bid would have to be much higher than if he bid upon the theory that the engineer would accept something else that was just as good but cheaper.

Then there is the question in regard to the use of wrought iron or steel pipe that is continually coming up. Some engineers specify wrought iron pipe and usually the contractors bid on the supposition that they will put in steel pipe. So, too, in connection with boiler tubes. Charcoal iron tubes may be specified and steel tubes put in. If the contractor thinks that the engineer means exactly what he says when he calls for charcoal iron boiler tubes, he has to bid higher than he would if he were to furnish steel tubes. And when the contractor makes his bid he knows that neither he nor the engineer can tell a wrought-iron pipe or boiler tube from a steel pipe or boiler tube without making a chemical analysis.

The instances which I have quoted

indicate a lack of experience or knowledge of details on the part of the engineer if he does not mean what he says. Now if the contractor is sure that the engineer does not mean what he says and if he be at all dishonest or inclined to take advantage of the ignorance of the engineer, it is very apparent that he could do so under the conditions which I have cited. And then again if the engineer showed a lack of knowledge of the details of the apparatus it is a fair question whether the contractor is not complying with the intent of the specifications when he puts in that article or thing which he has reason to believe the engineer meant when he wrote them.

I can well imagine that some of my friends who advocate the adoption of the metric system, or who are opposed to our system of numerals and our system of gauges, might say that the instances which I have cited are for the most part concerned with errors due to what they would term a vicious system of numerals and gauges. That, however, is not a question which I wish to discuss further than to say that even admitting the truth of that statement it does not in any way change the effect of my original proposition; that if the engineer knows what he wants and writes his specifications and draws up his plans in such a way as to impress upon the contractor the idea that he does know what he wants, he will get it; but if he does not know what he wants, or to put it in another way, does not know how to ask for what he wants, then if he falls into evil hands he is very likely to get what he decidedly does not want. The engineer in order to write the proper kind of specification ought to have a full knowledge of the subject, and the contractor in order to bid intelligently ought to know something of the engineer and of his methods, and this is the same as saying that the contractor and engineer ought to know one another and know considerable about one another's work.

Soo, too, is it in regard to the relations which ought to exist between the manufacturer and the engineer. The more intimate in a business way are the associations of the engineer with the manufacturer, and the more the engineer knows of the goods manufactured by the different manufacturers, the more competent is he to specify what he wants and the more advantageous to one another and to the consumer will be the engineer and the manufacturer.

A short time ago one of the engineering journals discussed that phase of the relations of the engineer to the manufacturer which deals with the specifying of certain special devices or machines. It was stated that a certain firm of engineers frankly told a manufacturer that they did not know anything of his goods and that, as they were already using the goods of a competitor which were giving perfect satisfaction, and as they were busy, they would not take the time to experiment or investigate the merits of the other goods unless they received payment for the work.

At first sight such a statement looks very much as though the engineers were attempting to hold up the manufacturer for a price to be paid in consideration of specifying his goods in competition with similar goods made by other manufacturers. It becomes a very grave question whether it is not a part of an engineer's business to keep himself informed about the goods of various manufacturers in order that he may pass upon the relative merits of each. It seems to the writer that that would certainly be the duty of the engineer if he posed at all as an expert in any particular branch of engineering. But of course if he were simply a consulting or constructing engineer, who was simply attempting to build structures or do work with material which he considers suitable, it becomes a question whether or not a manufacturer can reasonably expect the engineer to devote the time and work necessary to make an investigation of a certain device with a view of specifying or using this device, especially as no benefit

of any kind would accrue to the engineer for specifying or using this particular device in competition with another device which he has been using and which is perfectly satisfactory. Take, for instance, the question of a new valve or new heating boiler put on the market. Why should an engineer spend the time necessary to investigate the merits of the new valve or the new boiler simply in order to specify it so as to bring business to the manufacturer? From the point of view of the engineer I must candidly confess that unless an engineer wishes to become an expert in regard to certain devices or else loves to acquire knowledge, I cannot see why he should devote the time, attention and work required to enable him to know of the merits of a device simply in order to specify it in competition with devices with which he is already familiar and which have always given him perfect satisfaction, and which are made by a manufacturer who has always given good service. Of course, if the new device or article is such that it is going to bring about a decided advance in the art then it becomes a duty which the engineer owes to himself to look into the merits of it in order that he may be able to do better work and thus be of more value to his clients. From the point of view of the manufacturer I can well understand that he would not feel justified in paying money to engineers for their services in looking into the merits of a device, especially as the knowledge and education which the engineer would get might be such as to make him a more valuable man and make him of more value to his clients, and further as the engineer might decide after an investigation that he did not want to specify or use the device.

In what I have said I have assumed that all parties concerned are honest, as it is unnecessary to discuss the relations which ought to exist between the three upon any other supposition. If the engineer through a lack of knowledge puts certain requirements in the specifications which the contractor afterwards shows are unreasonable and induces the engineer to waive them the engineer is put in the unenviable position of appearing to favor the contractor after the work has been let, and the presumption at once is that he is dishonest, and that when the bids were submitted there was an understanding between the engineer and the contractor that the requirements would be waived. Of course, in such a case the contractor is put in the same unenviable position as the engineer; he is subject to the accusation of having bought the engineer. One is coated as much with the pitch as the other is with the tar.

So, too, where the engineer demands that the manufacturer shall pay him for his time and work in investigating the devices made by the manufacturer; if after the investigation the engineer, in all honesty, decides that he does not wish to use the device, the manufacturer at once jumps to the conclusion that the engineer is wrong, and that he simply took money with the full intention of not specifying or using the device, even after he had tested and investigated it. And if after the tests and investigation the engineer should specify or use the device made by the manufacturer he will be accused of specifying only those devices for the specifying of which he is paid.

Now, we all know that as there are dishonest men—men who will take advantage of the ignorance of others in all walks of life—so, too, there are such men among the engineers, the contractors and the manufacturers; and, if the engineer does not know what he wants and does not write his specifications and make his drawings in such a way as to show plainly to the contractors or the manufacturers that he does know what he wants, he is very likely to fall into the hands of dishonest people who will "do" him.

Hence, I think that it is a question of knowledge—knowledge on the part of the engineer of the kind of work he wants done, and of the devices and materials to be used in doing the

work in the best possible manner for the least amount of money; knowledge of engineering on the part of the contractor that will enable him to properly interpret the plans and specifications of the engineer, and further knowledge of the engineer and his methods of doing work; and last, but not least, knowledge on the part of the manufacturer how to make the devices necessitated by the state of art in order to enable the contractor to fulfil the requirements of the engineer, and knowledge of the business methods of bringing to the notice of the contractor and the engineer the merits of the devices manufactured by him.

In other words, the engineer must know something of the methods and business of the contractor and the manufacturer, the contractor must know something of the methods and business of the engineer and the manufacturer; and the manufacturer must know something of the methods and requirements of the engineer and the contractor. And this mutual knowledge on the part of one, of the requirements of the others, can best be obtained by frequent meetings; by the attendance at meetings of societies; at meetings where there will be an open, candid expression of ideas, and interchange of opinions.

PRODUCTION AND WAGES

At the recent meeting of the National Association of Manufacturers in Pittsburg President Parry said some things which are not the less true because some leaders of organized labor will make haste to contradict them with a vehemence of denunciation which will accomplish no good purpose. For example, Mr. Parry said that all employers would prefer to see labor highly paid rather than to see wage earners struggling for a bare subsistence. The trades union view is that the employer would grind labor into the dust if he could, and that only the substantial restraints imposed by organization prevent his doing so. The historical facts adduced in support of this contention are apparently convincing, but their significance disappears when all the circumstances are considered. Mr. Parry might also have said that most employers are glad to see their men organized and would find satisfaction in giving them all practicable assistance in the accomplishment through organization of reasonable and proper purposes, one of which would be the protection of labor against any form of oppression or injustice. If Mr. Parry does not feel in this way himself it is because he has learned to despair of any real advantage to labor from unions so largely dominated by unsafe and unprincipled representatives of what may be called trades union politics. That labor consents to be thus led warrants the conviction that the abuses of the trades union movement demand an alliance among manufacturers for their own protection.

Of the many truths enunciated by Mr. Parry the most significant is that the only way to increase wages is to increase the productiveness of labor. The intelligent manufacturer does not care how large the wages his workmen earn, provided they are large enough to be satisfactory. What he considers is the cost of production per unit of investment in the business he is carrying on. If this is satisfactory from the point of view of his annual balance, wages may double or quadruple, and the higher they go the better he will be pleased. This fact explains why the introduction of machinery has advanced the average wage for skilled labor far above what could have been paid before the per capita output was thus increased, and why every step in mechanical progress which helps to increase the productiveness of labor benefits it in increased wages as soon as the readjustment is reached. In the effort to limit production the unions which make this mistake are doing all in their power to restrict wages. That they do not know it is their misfortune.—*New York Times.*

THE HEATING AND VENTILATING MAGAZINE

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TO lay out a plant that will be good in every way and in which proper material shall be used without making the plant cost more than is necessary one must have a knowledge of prices of materials as well as a knowledge of engineering. In illustration of this we will relate an instance which came to our notice a short time ago. An engineer and a contractor were discussing the question of whether the main steam pipe leading from the boiler of a low pressure heating system should have an angle valve just above the boiler or should have an elbow with a gate valve in the horizontal pipe. The engineer wanted an angle valve, but the contractor said that the elbow and the gate valve would be better and would make a saving of at least five dollars, as the pipe was good sized.

The contractor could not convince the engineer until he got a price list and discount sheet of a certain make of high-grade valves and showed him the cost of the angle valve would be $17.28, while the cost of the gate valve would be $10.93. Then the contractor allowed 45 cents for the elbow, making the cost of the elbow and the gate valve $11.38, as against $17.28, the cost of the angle valve. This made a difference in favor of the gate valve of $5.90, and the contractor said that 90 cents would more than cover the cost of the nipple between the elbow and the gate valve and the labor of putting it in place.

By this time the engineer was in a receptive frame of mind and he invited the contractor to make a few more suggestions. When the contractor got through, the engineer knew more than he did before and the cost of the job was reduced by several per cent.

Now, two questions present themselves to our mind. First, isn't the gate valve and elbow better than the angle valve alone for low pressure work? And, second, isn't this knowledge of the cost of reaching certain ends the secret of the success as money makers of some contractors?

EVERY once in a while we get a letter inquiring about the French or European unit of heat, ordinarily known as the calorie. As a matter of fact there are two calories, or two units of heat, used in France and in other parts of Europe. One is known as the small calorie and the other as the large calorie. The small calorie means the amount of heat required to raise the temperature of one gram of water through one degree centigrade; the large calorie means the amount required to raise the temperature of one kilogram of water one degree centigrade; so that the large calorie is just one thousand times as large as the small calorie.

It is the large calorie that is almost universally used by engineers; we might say that it is always used by heating engineers, while the small calorie is used more by chemists and physicists.

The confusion due to the fact that

there are two calories sometimes leads to very amusing mistakes. We remember an article in which a certain engineer based certain arguments and conclusions upon the amount of heat involved in a certain process, as given in calories. The process had been described by a physicist, who had used the word calorie without saying whether he meant the large or the small calorie. As a matter of fact he did mean the small calorie. The engineer, however, discussing these results, had in mind the large calorie so that the results as talked about and discussed by the engineer after he had translated them into English units were just one thousand times larger than they should have been.

A kilogram is equivalent to about 2.2 pounds and one degree centigrade is equivalent to 1.8 Fahrenheit degrees, so that one large calorie is equal to 2.2 x 1.8 or 3.96 British thermal units. In ordinary calculations where an error of one per cent. is of little or no moment, and in all calculations in regard to heating work, it is sufficiently exact to say that one calorie, that is, one large calorie, is equal to four British thermal units, assuming always that one British thermal unit is the amount of heat required to raise the temperature of one pound of pure water through one degree Fahrenheit.

Having this relation in mind it is exceedingly easy to change calories to British thermal units or to change British thermal units to calories. When we wish to change calories to British thermal units we multiply by four; when we wish to change British thermal units to calories we divide by four. For example, we ordinarily assume that one square foot of direct radiating surface of a low pressure steam heating system will emit about 260 British thermal units per hour; divide this by four and we find that one square foot of heating surface in an ordinary low pressure steam heating system will emit about 65 big calories per hour.

SPEAKING of calories naturally brings to mind the difference between the thermometers used in this country and in England, and those used in France and other parts of Europe. In this country the Fahrenheit thermometer is almost universally used, and all of the tables used by engineers in their work are based upon the supposition that the Fahrenheit thermometer will be used, whereas in France and some other parts of Europe the centigrade thermometer is used almost to the entire exclusion of the Fahrenheit.

Centigrade thermometers such as are usually used for rather exact measurements in engineering work will be found to be graduated to one-twentieth of a degree, while Fahrenheit thermometers used for the same class of work will usually be graduated to one-tenth of a degree. The result is that some people think that the centigrade, because it is graduated to read to one-twentieth of a degree, gives closer and more exact results than a Fahrenheit thermometer which is graduated to read to one-tenth. They forget, however, that the length of a degree on a centigrade thermometer is 1.8, or nearly two, times as long as the length of a degree on the Fahrenheit, so that one-twentieth of a degree on the centigrade thermometer is equivalent to about the same amount of heat as

one-tenth of a degree on the Fahrenheit, and the two thermometers are practically the same so far as exactness due to graduation is concerned.

A CORRESPONDENT has written to us asking what is the speed of circulation of water in the pipes of an ordinary hot water heating system, and as the question is rather indefinite we have written him for further information. In the meantime we wish to say that the velocity of circulation of water in the pipes of an ordinary hot water heating system varies between rather wide limits. The speed at which it is possible to circulate the water depends upon the size of the pipe; the length of the pipe; the number of bends or elbows in it, the kind of elbows, whether short or long radius; the height above the boiler of the radiation supplied by the pipe, and also upon the difference in temperature between the water in the supply pipe and that in the return pipe. We are all familiar with systems in which the velocity of circulation is zero; that is to say the water does not circulate at all and they are the ones that give us the most trouble.

Of course our correspondent means, in an ordinary system that is working well, what would we expect to find the velocity of the water in the different pipes, assuming the pipes to be proportioned according to the sizes of the radiators they are to supply. The velocity will usually be between $\frac{1}{2}$ foot and $1\frac{1}{4}$ foot per second. We think that for ordinary conditions of pipes and differences of temperature between supply and return a velocity of about $\frac{3}{4}$ of a foot per second will be found fairly satisfactory. This is lower than would be found in the pipes leading to the top floors of a high building, but is about what would be ordinarily found in the mains of a two or three story building. When we hear from our correspondent as to what he means exactly we hope to be able to discuss this further.

IT is an old saying that "majority rules." Many of us know that this is not always true and perhaps not true in most cases. In political matters the ordinary conservative citizen who is attending to his business is in the majority but feels that he cannot take the time, and perhaps he has not the special ability for political work. There are others who would rather play politics than do ordinary work, particularly if thereby than can maintain themselves.

In many of our cities the so-called good citizens emphatically object to the manner in which their city is governed. Their complaint is usually expressed in letters to the papers or in conversation with their cronies. The other class who may perhaps be called the bad government class are in politics all the while, so that when it comes to a vote the difference between work and no work is shown in the results.

It was once said of a Chicago alderman who had been detected in a bribery scandal that he was misrepresenting his constituents. A Chicago paper said he was not misrepresenting them; that if that ward sent a man to the common council who did not take advantage of his opportunity to get money out of the electric light companies, the street car companies and anybody else that wanted a franchise, he was not equal to the re-

quirements of his position. That was not true, but the minority ruled.

About the same thing is true in many of the trades unions, whose strikes have caused so much annoyance and loss during recent years. It has been said of them, as it has been said of cities, that "majority rules" and they are getting exactly what they want, but this is not the fact. The minority rules, the always busy, politically inclined minority. It is almost certain that in many of the recent strikes a large majority of the men would prefer to continue working, but they are overruled by others who do not want to work, but who are active and capable in organization and in pulling wires.

That has always been true and probably it will always continue to be true. The secret ballot in union proceedings would help the situation somewhat but would not altogether alter it. This is not a pessimistic view, but is a statement of the conditions as they exist and as they doubtless will continue to exist so long as human nature remains what it is to-day.

EVERY heating contractor knows that he is sometimes a little puzzled over the figuring and designing of a heating system; he also knows that he usually spends a great deal more time, in proportion to the amount of money he is going to receive, in studying out the best way to correct a defective plant without an excessive expenditure of time and money.

We think everybody will therefore be interested in the example of such a job which appears on another page of this issue. The man who did the work states that he does not consider it a particularly brilliant example, but it was uppermost in his mind at the moment because of the considerable special interests involved, namely: the reputation of a good boiler and the relation between a boiler manufacturer and one of his good customers.

In such a situation the heating engineer occupies very much the attitude of a physician who is called upon, first to diagnose the case and see what is the matter and then to see how it can be best remedied, having due regard for the amount which the patient is willing to pay. Some sick people, for example, can readily leave their business affairs and take an ocean voyage or spend considerable time in the mountains or at the shore. Others have to be treated at home, and cannot even take the time nor afford the money to avail themselves of the benefit of hospital treatment. In such cases the patient has to be fixed up with the least possible expenditure of money and the least possible encroachment upon his time.

In the case which we describe, the engineer was anxious to cut down the expense of overhauling to the lowest possible figure and yet to make the job work so that the owner would have a warm building, the steamfitter would be convinced that the boiler was all right and the manufacturers would have to pay little or nothing beyond the cost of sending the engineer to make examinations and recommendations.

He succeeded to just about the full extent of his purpose. He did not make a very scientific job—not at all such a job as he would have put in in the first place—but he did get heat in the building, and that was what everybody seemed to want.

SMOKING COMPARTMENT REFLECTIONS

Once more the gladsome summer time leaves us as it is in the habit of doing at about this time on the calendar. The approach of the equinoctials will bring relief to many an overworked stomach. No more the deadly but seductive clambake will disturb our livers and no more shall we crowd into already crowded boats and cars to observe the agile twirlers monkey with the sphere or to see the bangtailed horses play into the hands of the bookmakers; but also, alas, no more shall we go sailing down the bay or get under the foaming mountain of a soul-stirring breaker. We shall shed our straw hats and our negligee shirts and look like staid citizens.

One of the heating men's resorts has been the famous Waldorf-by-the Sea, at Rockaway. It is there that Timothy Kieley reigns supreme, for does he not own all of that part of the coast, including the hinterland, and control a sphere of influence far around? His register shows names famous in heating annals. Even Superintendent Waters of the Chicago Board of Education came out of the West, like young Lochinvar, but unlike that celebrated hero, he is not reported to have galloped away with anything that did not belong to him. Of course, there were people there not in the heating business, but heating specialists felt that they owned the place.

I did not know that so many heating men were of the Masonic order until I fell against the clambake of the Americus Lodge Association, which was owned, controlled and operated by H. A. Joslin and E. H. Roberts—at least they did all the work and the rest had the fun. You could have placed an order for a complete heating system there, from the boilers and radiators to the valves, floor plates and specialties, and you could have found engineers to lay out the work and contractors to undertake the installation. Most of them had crossed the burning sands and knew when to hold on to the rope, and every one of them knew how to make the grand hailing sign of distress.

Secretary Gombers, of the Master Steamfitters, has been sojourning out on the north shore of Long Island, which was good for him and for the Association because the food and air are good, the bathing just right and all the accompaniments are just what they should be. Mrs. Gombers, Miss Blackwood and the chestnut pony were with him.

Miss Blackwood has not lost a coat since at Atlantic City—one of those fortunate little accidents, you know.

New York is setting up a new heating center. Of course, there are two, one down among the furnace men around Water and Beekman streets, but the other, which used to be on Centre street, has moved up higher.

Now the heating business is pretty well bunched around Madison square, which is a nice, ladylike location. Within gunshot of the square are to be found the American Radiator Co. and the Kellogg-McCrum-Howell Co., side by side in a big building, with Pierce, Butler & Pierce and Frank McClain just around the corner on Fourth avenue, Johnson Temperature Regulator Co. near at hand, and Geo. I. Roberts & Bros.

a little way up the avenue. Coming up Fifth avenue from Eighteenth street, we find Powers Regulator Co. and the Gurney Heater Co. in the Constable Building, Prizer-Painter Co. in the Mohawk Building, U. S. Radiator Co. and Smith & Thayer in the Flatiron Building, THE HEATING AND VENTILATING MAGAZINE in the Townsend Building, and Lord & Burnham and the Fuller Warren Co. next door in the St. James Building. All around are large heating contractors, so that whene'er I take my walk abroad, I fall upon a few of those whose minds are running in the same business direction.

From the center of the heating industry start the big "Seeing New York" automobiles. It is an oasis in the desert of a strenuous day to see those big machines crowded with contented sightseers. To look at their countenances, beaming with cheerful interest, makes life seem brighter for a few minutes. They have nothing on their minds but to listen to the melodious tones of the barker as he works the megaphone; "On the left—Fifth Avenue Hotel—headquarters of the Republican National Committee. In there is the famous Amen Corner and that benevolent looking old man just going in is Senator Platt —Fifth Avenue Hotel—on the left."

"Next is the Hoffman House—headquarters of the Democratic Committee—on the left—those men standing in the doorway are half of them Tammany tigers and the other half southern colonels. Hoffman House—on the left."

How can there be worriment in the soul when you can have everything shown you in an hour, from Grant's Tomb to Helen Gould's residence, from the Townsend Building, home of THE HEATING AND VENTILATING MAGAZINE, to the Waldorf-Astoria and the new St. Regis?

A well-known young heating man of New York was shocked to see in the newspaper an item to the effect that he had been taken off a railway train at Binghamton in a state of intoxication. He was not in Binghamton at that time, but was in New York all day, and the man who was taken off the train has been in the hospital ever since with typhoid fever and never touched a drop of intoxicants in his life. In other respects the story is entirely true.

I found Harry Bristol the other day at Albany, standing on the station platform. I thought he was on some thermostat business but he explained that he was waiting for a train to take him to New York as he was returning from a fishing trip in the Adirondacks.

I believed him then, but now I have reason to suspect that there was a brand new Mrs. Bristol just out of sight and that he was just getting home from his honeymoon.

A man was setting forth the other day the proposition that the hand that rocks the cradle sometimes raises the mischief with the world. His illustration was the case of a house lately bought in New York for $20,000. That was the man's business. Then madam got in her good and perfect work. She found things that were not to her liking, and after they were changed in accordance with her suggestion they did not suit her so they had to be done over again in another way. When her tired brain stopped for a little rest, the expense of the alterations amounted to the stunning figure of $60,000. Such things make us gasp.

I heard a similar complaint a few years ago. A man had just bought his third boiler from a manufacturer and explained that was the very last. Previously he had bought a few furnaces. Now he was going out of the buying business and somebody else would have to furnish business for the heating people.

He said his wife would sometimes have a quiet evening for rest and contemplation, then he knew something

was going to happen, and generally it did.

She would say, "My dear, I don't like the chimney on that side of the room. It does not lend itself to the best decorative effect and a much better location would be over on this other side." The only refuge was silence, in the knowledge that the chimney could not be moved to-night and to-morrow might bring oblivion. A few evenings later it would transpire that the lady had got prices on some perfectly too beautiful fireplaces and that they could get the real thing for about $100. Then it was hopeless, and the side of the house was torn down and rebuilt and two or three rooms made over with all the corresponding worriment and expenditure of money. Finally the house would become so unsatisfactory that there was nothing for him but to build another, and when that had been built over a few times still another. "Now," said the kicker, "I have built up that entire side of the street for one block and I decline to start on another block. This positively is my last appearance on the builder's stage and when this building gets passé, I move—either into a hotel or into the cold and silent tomb."

The sprightliest youngster in the whole heating business is Clarence V. Kellogg. He uses up more railway mileage in the course of a week than anybody in New York. He puts all of the traveling men away to the bad. You hear of him one day looking over the boiler works at Norwich, Conn., and the next day he is scrutinizing the situation at his Chicago office; then he is presiding over a meeting of the Carbon Club in New York, and then exploring the Irish Village at St. Louis, where he is the head Irishman, and then he comes to New York long enough to see what has happened, and you hear of him next at Uniontown, inspecting the radiator plant, then at Blairsville, giving expert judgment on the enameling of bathtubs. By the time all this is done, he has another meeting of the Carbon Club, and then, like a proper president, he presides.

All this seems not in the least to detract from his youthful vigor. He is getting younger every day.

"I can see how a little money might be made out of your Smoking Compartment," a man said to me the other day. "What is your Smoking Compartment for if it does not have placards stuck up all around it telling how to prolong your life? They have them in the elevated trains and in the trolley cars, why not in smoking compartments?"

So, some time you may see this Smoking Compartment with signs stuck up all around it, something like this:

For a bad case of blues,
Use Foster's Ornamental Fluted.

Now is the time to buy:
Kellogg-
Mackay-
McCrum-
Cameron-
Howell-
Richmond
Boilers.

August is the month in which to
Try it on (Triton—see?).

Still Waters run deep
But Johnstown radiators
Transact business all the while.

The boy who cried Wolfe too often,
Finally had to buy
Some wall radiation.

Hell knows no fury,
Like a woman's corn.
Kieley temperature regulators
Are a sure cure for corns.

Chuck Pratt and Chuck Connors
Are not two birds of a feather,
But then it is an old saying that
A bird in the hand gathers no moss.

Ten-dollar Bill Russell
Makes plates between smokes.

THE SMOKER.

CORRESPONDENCE

We Lose a Subscriber and They Don't Get the Magazine

Editor HEATING AND VENTILATING MAGAZINE:

We have yours of the 18th inst., suggesting that we subscribe for the HEATING AND VENTILATING MAGAZINE.

This reminds us of a railroad friend of ours, who has passes on all roads the country over, but did not happen to have any one day on a certain road over which he was traveling, a distance that called for only ten cents expenditure. It hurt him more, however, to fork over that ten cents than it would to have hired a special locomotive.

It is the same way with us. As we receive any number of copies of publications without charge, we would almost feel like going into bankruptcy if we subscribed for any paper, no matter how much it might be worth. Such is the force of habit! ——— ——— ———.

Warm Air Heating

Editor HEATING AND VENTILATING MAGAZINE:

Referring to your discussion in August number of Mr. Jones' system of warm air heating, the cellar plan gives 12-inch pipe for sitting room which equals 113 feet. Is not 103 then a misprint? May he not have had reasons for making the dining room chamber extra warm, for sickness, etc.? Also for sewing room, to provide for continued sitting? The north chamber should have rather more heat than other rooms. Has he not used the heating engineer's judgment in his variations, as, except in the sitting room, he has increased rather than diminished his pipe area? A. T. R.

ANSWER BY MR. JONES

One hundred and three is not a misprint, but the area of the bottom opening of the register used for heating this room, as it is slightly reduced on account of a timber or beam, and an area equal to 103 square inches is actually what is being used for heating the room.

In regard to the extra heat in the dining room, will say that this is a southwest room and the prevailing winds in this city are from the southwest; that is to say, that we have a great deal of southwest wind during the winter months, and we find the southwest rooms hardest to heat. Another reason for making the dining room good and warm is because it is one of the first rooms to be used in the morning. The sewing room is provided with an extra amount of heat, inasmuch as it is used somewhat as a sitting room.

I might say that the article read before the American Society of Heating and Ventilating Engineers was in the nature of a review of the results obtained from a warm air furnace installed with Jones Registers, where two rooms, one on the first floor and one on the second, were heated from one large basement pipe. By referring to this article you will notice that in considering the fact that a great many furnace dealers oppose a plan of warm air heating where two rooms are heated from one large supply pipe, and knowing from experience that the same is practical, the writer was prompted to describe a system heated in this way as proof that such a system is thoroughly practical, and while I would change the figures were I preparing an article solely on theory, the rule laid down is practical; but as Mr. R. says, the heating engineer's judgment has to be used in a great many instances.

Some Don't

Editor HEATING AND VENTILATING MAGAZINE:

Why do all editors put their title page half way inside their magazines and not on the front page? Those seeking the address must wade along till they find that fool page, away in the middle of the book. It is a jackass lay out, but they all do it. KNOX DOWNE.

ANSWER

They all do it, but some don't. There is a difference in varieties of jackasses. One kind "knocks down" straw men set up for that purpose.

If our correspondent had looked on the title page instead of guessing at a mark, he would have found there the information he wanted and would not have had to look at our "fool page."

With Interest and Pleasure

H. A. Smith, Editor:

The July number of your magazine has been read with interest and pleasure. You should attain success and to help you to do so, and because I want the paper regularly, I enclose one dollar for a year's subscription, commencing with the August issue.

J. HOWELL JOHNSON.

"Knox Downe" Interrogates Hugh J. Barron

Editor HEATING AND VENTILATING MAGAZINE:

Please have Mr. Barron rise and explain what is meant by "feet of surface of pipe." His dominating notion that "we want a unit of time" is all right;

but those who know him as a deep student will be surprised at his selection of words to convey his meaning. Does he mean square feet of surface of pipe, or lineal feet of pipe, when he says "feet of surface of pipe?" I have had fitters who would be ashamed of their day's work unless they ran a 50-foot pipe coil with 8 pipes in height, or 400 lineal feet of pipe, and 133 square feet of surface. Such work would require 24 screws cut and a change of dies from right to left threads. It is also true that were there no cutting of threads, but the pipe run straight, a man could do twice as much when measured by the lineal feet, or by the square feet of surface. It is equally clear that men will not run as much pipe on a ceiling as close to the floor, so the guess must be considered in estimating the amount of work done by workmen.

When Mr. B. asserts, "The thing that is making all the trouble in the world today is labor," he is wrong. True, labor makes much trouble; but will Mr. B. assert that Russia and Japan are wrestling because of labor troubles? Or that inebriety, which also causes trouble, is labor? Or that laziness, which causes trouble, is labor? I fear Bro. Barron's theory won't hold water; that he is unhorsed. Will he assert that a toothache is labor? Yet a toothache causes trouble. True, labor has become despotic. It antagonizes the teachings of Christ. No labor advocate can be a Christian. He must hate his fellow man, unless he is of the union. He must antagonize Christ's teaching, that all must earn their bread by the sweat of their brows. It is truly astonishing that sane governments permit labor abuses such as prevail and that sane employers tolerate labor dictation as it is. But Brother Barron cannot sustain his theory that "labor is the cause of all the trouble in the world to-day."

Respectfully,

KNOX DOWNE.

ANSWER BY H. J. BARRON

I mean, as I clearly stated, "square feet of outside surface of pipe." A specific coil of 133 square feet for a day's work would not be extraordinary, but that is not the requirement in formulating a unit. The idea is to get the average as the labor factor in engineering. The guess or judgment cannot be eliminated, but checks are wanted. Some years ago in one of my papers I put down 15 cents per square foot of radiation as the labor cost on a low pressure steam job.

What I aim at is as old as engineering. For instance, the net cost of tubular shell boilers, among boiler makers is, say, 6 cents per pound; and the net cost of producing a milling machine, among machinists, is 40 cents per pound. The net cost of producing radiation among foundrymen is, say, 2 cents per pound. Expert estimators employed by the large steam heating contractors have all sorts of checks in estimating, and weights of materials and dimensions of surfaces are the best and safest methods to depend upon.

My letter to your paper was suggested by a discussion I had with my former assistant, Mr. Devitt, who mentioned that Mr. Blodgett had told him that he used a unit for certain classes of work. My effort is to get as near as possible to a general unit for our special business. Where pipe is all cut in the shop, as it should be, and if the men were properly trained as workmen from boyhood, then I believe 100 square feet would be an average day's work, and the time may soon come when all boys will be trained to mechanical trades and through this training become wonderfully expert; but a discussion of that subject would carry me into a field outside the province of your magazine and would fill space that you cannot spare.

Now, in regard to the general subject of labor; as a workman I looked at things as well as I could from the employer's, or my boss's, standpoint, and I know the average worker does so. As a boss, I looked at labor as well as I could from the worker's standpoint, and I think most bosses do. I would ask my friend, whom I judge is a workman, to read "Social Evolution," by Benjamin Kidd. If I am mistaken, and he is an employer of labor, I would ask him to read "Das Kapital," by Karl Marx.

It does not take much discernment to see that the labor question is the one and only one before man. Labor to-day absolutely controls New Zealand, and in time with us the only man allowed to vote or hold office will be a member of a labor union, or trade organization, in other words, a producer of wealth, and the non-producing classes will have no share in the government. The duty of science is to find proper expressions for the value of various kinds of labor, and if in steamfitting we can reach a standard of an average day's work, it is worth doing.

I cannot attempt to go into the religious argument; it is all right, but it seems there must be misunderstandings in everything. The sellers of labor as well as the buyers thereof are often unreasonable, but the business of life is to adjust things, and it is in process all the time or the cosmos would have ended long ago.

My statement that ultimately non-producers of wealth will be disfranchised sounds rather extravagant, but economics is a vast subject, too vast to be made clear. Prof. W. G. Sumner, some years ago published an article entitled "Do we want industrial peace?" in which he shows how academic it all is. He says, "Industrial war is a sign of vigor in society," and "the classes which constitute the masses should go on to win all the power which is thrown into their hands by the

facts of the situation." There never was a strike or labor trouble that could not be fixed if approached in the religious spirit of our friend.

Certain of Success

Jersey City, August 9, 1904.

Editor HEATING AND VENTILATING MAGAZINE:

We have received a copy of your magazine. The information and articles which it contains we find very interesting. We believe that a publication which makes a practice of handling these problems in a practical manner, such as you have apparently set out to do, is more than certain of success.

Yours very truly,
A. A. GRIFFING IRON CO.

H. A. Smith, Esq.,
New York.

Dear Sir:

Your HEATING AND VENTILATING MAGAZINE is just what heating people need.

Send me a dozen copies and I think I can get you about a dozen subscriptions.

Yours truly,

Sales Manager.

The Engineer, the Architect, and the General Construction Company

Under the above head Reginald Pelham Bolton contributes an interesting article to the *Engineering Magazine* for August.

He starts by saying that the architectural profession has not infrequently recognized its responsibility for the results of its professional work, and has advanced in many ways along lines of modern development. But it has curiously failed to recognize its responsibility in another and more important respect; namely, that of the acceptance of fees in payment for certain technical and artistic work which its members are not qualified by training to execute, and in which they are not expert in the same sense as they are in connection with actual building design. The position occupied by the profession in this is not logical, and has brought about a very disastrous state of affairs as regards their employment in the largest building enterprise.

The article goes on to say that architects profess to be expert in the design and construction of the work they undertake and that in employing an architect the client pays for personal ability and technical knowledge which he is entitled to receive. If the architect is without expert knowledge in any one branch he is under moral obligation to supplement his deficiency by furnishing the expert knowledge of others.

Mr. Bolton alludes to the practice of some architects of hiring comparatively cheap draftsmen and paying them as consulting engineers, but if such an expert is in the pay of an architect he can hardly be relied upon for independent work. He admits that there are two sides to the question and that a few engineers are also posing as architects, but as he says, the number is extremely limited.

It is suggested that one of the most important points is in connection with steam apparatus, for in this the author says that the owner's pocket is particularly and permanently assailed. He says that a trip up Broadway would reveal boilers in dark and stifling sidewalk vaults which are a menace to public security, since boilers so placed cannot be properly maintained in security; boilers far away from the chimney, necessitating horizontal smoke connection, in one case 225 feet long; boilers, as in one well known building, so badly placed and connected that when steam is raised in one the expansion pulls the piping off the other, or, as in one of the large insurance buildings, placed in the same room as the machinery, with space for only one day's fuel. Such instances could be multiplied.

The Building-Construction Company Mr. Bolton describes as a recent development of the pretentions of the builder to the possession of the facilities of the architect, for which he thinks the architectural profession have themselves to blame. The construction company can make a price for which they will turn over a complete building and undertake to carry out all the architectural details and engineering work; but he points out that their experts are often small contractors or else assistants of the same order as those previously referred to as being employed by some of the architectural profession. Some of the results of this kind of service the author illustrates by instances which have come under his knowledge.

The tone of the article is somewhat pessimistic, arriving at about this conclusion: "I don't know if there is any good in attempting to draw beneficial lessons for the education of an educated class which is, withal, too careless or incapable to take elementary precautions as to its own rights and property. One would suppose that a most limited intelligence would enable a property owner to perceive that he is not likely to get something for nothing out of a smart firm of general contractors."

The article closes as follows: "Not until it is much more widely understood that the mechanical apparatus in a building is a part of it that directly affects the pocket of the owner, that in it and by it he is

being constantly defrauded and fleeced, will the present state of affairs be amended.

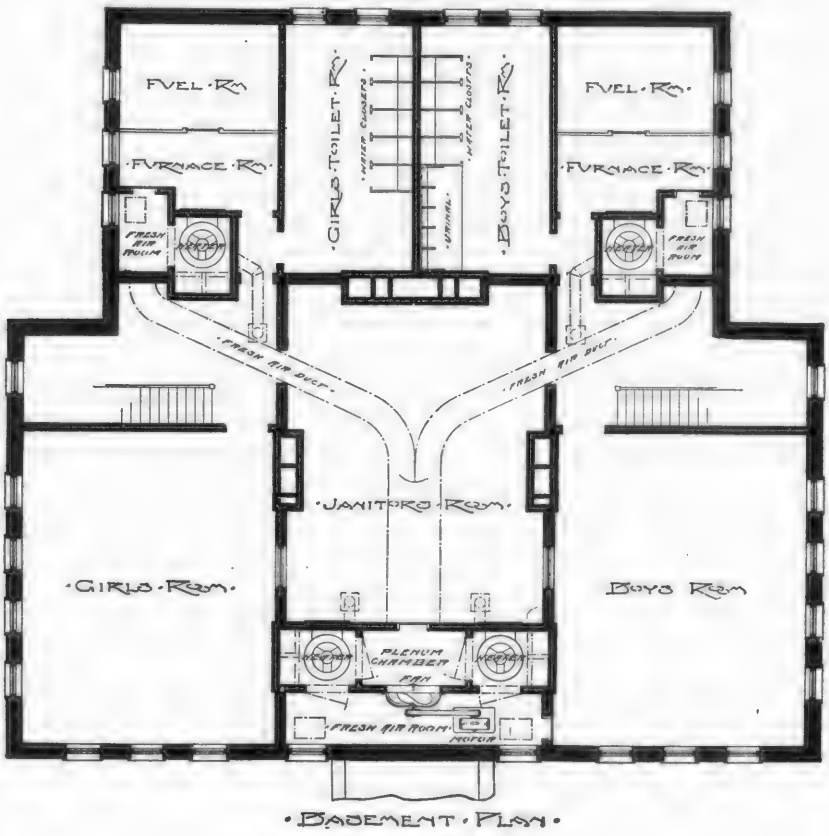
I have recently had the opportunity of laying these views before one of the great mortgage-insurance companies, whose action will in future take into account the imperfections and deficiencies of mechanical apparatus in the building in which they take an interest. It may be that others will awake to this, to them, important element, and that through their action careless ownership will be aroused.

Having sat for ten years past between these elements, and having had the good fortune not to fall into the evil graces of either, I am in hopes that my plain speaking will be taken in good part and that all parties will proceed to set their courses with a little more regard for their true interests in this age of engineering detail. And I am thankful to record my knowledge that there are architects who fully live up to their undertakings in the respect I have named, as there are builders who are conscientious, and as there are owners who are capable of appreciating the value of the old saw—'Every man to his trade.'"

A Hot Air Ventilating Plan

The accompanying illustration is from a book entitled "Heating With Ventilation," for schools and other buildings, published by the Boynton Furnace Co., New York, Chicago and Boston.

The system indicated herein is intended to be operated on the gravity system when atmospheric conditions justify it, but it is designed to be operated with a fan and water motor, to be used when there is not sufficient difference between indoor and outdoor atmospheric pressures or temperatures to create a satisfactory movement of air in the rooms.



A HOT AIR VENTILATING PLAN

Allusion is also made in the book to a building heated by the same plan, but using steam for the heating medium and an electric motor for the fans.

The whole book is interesting and valuable. Copies may be had on application to the Boynton Furnace Co. at either of their offices.

New York Radiator Co.

The accompanying illustration shows the new four column radiator for steam and hot water manufactured by the New York Radiator Co., Utica, N. Y. This radiator

is made in seven heights, ranging from 18 to 41 inches, each section is 13 inches wide, or, including legs, 13⅜ inches. The sections are connected at top and bottom with extra heavy 2½-inch slip nipples.

Full instructions are given in the company's price list for tappings and for locating connections.

As will be seen by the illustration, this radiator has the handsome ornamentation so well known in connection with the New York radiators, and from the arrangement of the surface it is plain that efficiency and economy are combined with compactness, and a consequent saving in space.

NEW YORK FOUR-COLUMN RADIATOR

An Ideal American Exhibit

Art and utility have joined hands at the exhibit of the American Radiator Company at the World's Fair in St. Louis. It is true that no exhibit at this Fair presented to the view of home builders and home lovers is more instructive, more interesting, more practically artistic, more helpful than the "Model Colonial Home" in the Manufacturers' Building, which exhibits in a fashion well calculated to make last impressions, the highest modern developments in apparatus for home warming and water supply.

The American Radiator Company may well congratulate itself upon the happy adaptation of this special exhibit to the purpose of educating the people from all parts of the world who may visit the Fair. Thousands whose experience and observation have not given them a right idea of the great importance and value of modern warming methods in their relation to the upward trend in human affairs, will here gain a more correct and just estimate of their practical value.

A person unacquainted with these methods might enter this exhibit filled with thoughts which portray steam or water heating outfits as compound, complex, difficult, abstruse "systems" or "complicated plants"—and leave it with an idea of their wonderful simplicity—and in these

days of complicated mechanism, things which are really simple may truly be classified as wonderful. With this idea of plain-working utility the visitor must necessarily be very agreeably impressed with the clean cut, attractive character of the goods turned out for the purpose.

No photograph or other view can do full justice to the elegance and harmonious altogether of this exhibit. It is furnished in excellent and dainty taste—yet in strict keeping with the original idea—to represent a house to cost about $5,000 and with furnishings agreeably suitable to that class of modern American homes.

The general features of the main first floor rooms give out the idea of inexpensive yet very refined taste in furnishings. The dark flemish oak wainscoting and ceilings of the cosy dining room, the rich yet simple Craftsman furnishings of the sitting room, the unique little conservatory with its French square lattice windows, all blend into a restful atmosphere of domestic tranquility. The little stairway hall, brightly decorated and warmly carpeted, seems to proclaim a bright and cheerful welcome to the incoming guest.

In the same spirit of easy, graceful, artistic finish, various types of American Radiators are placed at points where they best illustrate their service and co-operation in the scheme of furnishing. It would be difficult to conceive how any person could find ought but admiration for the beautiful "Verona" with its perfect grace of outline, fineness of ornament and finish, standing in the lower hall like a faithful sentinel to give forth its message of good cheer and unfailing comfort.

In the dining room a lowly, modest "Rococo" (inconspicuous in its coating of black Bauer-barf) blends most agreeably with the rich dark woods of that apartment.

In the upper rooms the restful simplicity of the appointments—decorations, curtains, furniture, all combine to deeply interest the ladies who call. And in these upper rooms the practical application of direct radiators, enameled in white, serves to show the interested how these highly finished modern distributors of warmth assist to elaborate the rooms, and how cleanly and cleanable they are. These apartments bring out many exclamations of pleasure from the ladies.

In fact, there is not one point in the whole exhibit which does not appeal to the interest and admiration of the American woman; and who will allow ancient prejudice (due to the imperfect and crude products of gone-by days) to give place to the ideals which are here illustrated. This exhibit very clearly shows that the modern up-trend in the higher development of home life has brought the artistic, the practical and the economical into a close-knit union which must forcefully appeal to the appreciation of home makers of all classes. There is an air of simple richness about this exhibit which is interesting to people of large wealth, while it also attracts the people of less means.

The living room (to the right of the view) is warmed by a small window-seat radiator and by an indirect radiator which, with the equipment in the heater cellar, illustrates the highest state of mechanical perfection in indirect stack work. It is finely installed. The galvanized ducts which supply fresh air and conduct the warmed air to the room above are flat curved and without elbow joints. The several hand-hole doors are fitted with brass hinges and catches, and all the fitting and joints are substantially perfect, pointing the mode and way to install cellar work without any chance of dust or dirt passing from the heater room to the rooms above. The stack shows a method of indirect work which should endure as long as the boiler.

In the boiler room an Ideal Sectional Water Boiler has been finely mounted and trimmed—finished in black. By its side a neat little Iideal Laundry Tank Water Heater shows its value and utility as a modern household convenience and necessity.

Another feature of much attractiveness and merit is the fine display of elegantly decorated radiators shown in the front yard—in the space between the house proper and the fence which is made up of single column Peerless Radiators finished in white.

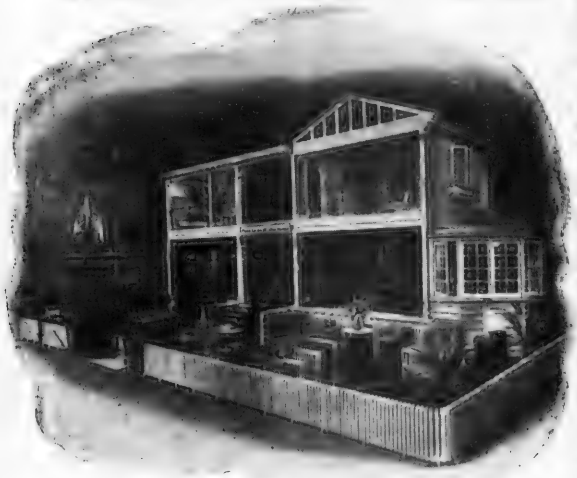
There is a rich elegance to the types of "Verona," "Rococo," "Premier" goods and other patterns here shown, which fully demonstrates our claim—that the American Radiators comprise the highest products of art in iron work ever turned out by the founding handicraft and offered to the trade and property owners anywhere. A finer display of radiators the world has never seen at home or abroad.

The arched entrance of twinned Ideal Boilers betokens warmth of welcome and the dignity of the exhibit. The surrounding exhibit of boilers and tank heaters is very attractive—very interestingly showing up the wide range of their various types of construction. Decorated in black Bauer-barf with bright red interiors illuminated by electric bulbs inside, they present a very striking and realistic appearance to passer-by and guest.

The entire exhibit is illuminated constantly by electricity, day and night, and is made breezily delightful by a series of electric fans in various departments.

The spirit of this undertaking is to plainly, simply, interestingly "show the people" how they can make their homes reliably comfortable and attractive by modern steam and water warming apparatus—how to increase their living, renting and selling values. And it goes without much saying that the goods—Ideal Boilers and American Radiators—are as matchless for the purpose as the methods themselves

are superior. No person who has seen the exhibit and who is familiar with the general run of this class of merchandise,



AMERICAN RADIATOR COMPANY EXHIBIT AT THE ST. LOUIS WORLD'S FAIR

can arrive at any other conclusion—and be fair to his own just sense of discrimination.

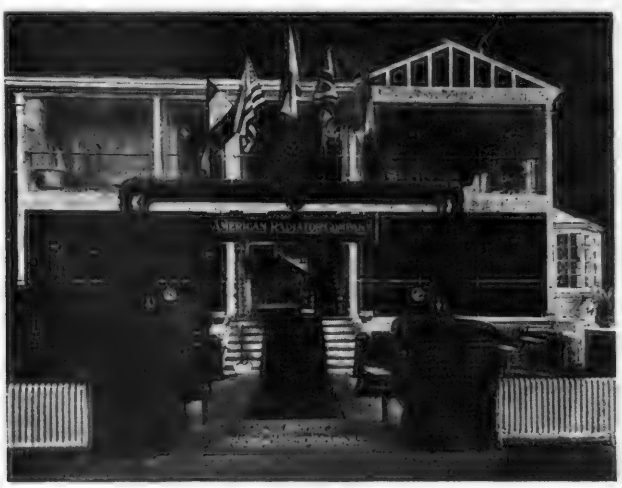
This Model Colonial Home is an instructive object-lesson in home making and equipment. It is a tribute to the architectural profession and at the same time a forceful testimony to the intelligence manifested by the workers in the steam and water heating business, whose skill and enterprise are keeping well apace of the advancing movement for better, more comfortable and more sanitary homes.

It stands as a fitting tribute to the engineers and fitters of America and shows how and wherein the American Radiator Company is doing its level best to augment their endeavors and assist with the finest goods in mechanism and artistic appearance. It should accomplish much for the joint interests which are so deeply concerned in the better exploitation of the merits of both methods and materials.

We can in some measure estimate the good to be accomplished by stating that about 100,000 people have already called to note and carry away good impressions of the modern ideal American home, warmed by water, to every corner of our planet, and, as several thousand have expressed some interest, it is safe to predict a few thousand extra sales during the next five years.

An interested person may visit this exhibit, then view the generality of regulation booth-exhibits at other parts of the Exposition. When he or she returns to the Model Colonial Home—and many often do return—the latter seems to spread out like a bouquet of well assorted fragrant flowers—harmonious, pleasing, very welcome to sight and sense. The contrast is quite striking.

It may be well to add that the very enduring and pleasing impressions which this exhibit must leave on the receptive minds of visitors are being admirably reinforced by the exhibit management. Every guest is treated with particular courtesy and cordiality. Special endeavors are continually exercised to give careful specialized expert attention to the varying phases of the home-warming subject presented by each interested inquirer. Thus, by intelligent discussion, guests are enabled to form some very helpful conclusions concerning the adaptability of steam and water warming apparatus to their own specific needs.



AMERICAN RADIATOR COMPANY EXHIBIT AT THE ST. LOUIS WORLD'S FAIR

An Artistic Symbol

One other feature of this exhibit is worthy of special mention—the bas-relief

which adorns the space over the front entrance and which is illustrated by the accompanying engraving. This fine piece of art was modeled by Mr. Isidore Konti, of New York city, who is one of the rising sculptors of the present day. He furnished about twenty pieces for the various Fair structures, receiving the largest number of orders given to any of the artists who contributed to the external ornamentation of the Exposition. The fountain pieces at each end of the Colonnade of States, with gilded figures typifying the "Atlantic" and "Pacific," were made by this gifted artist.

Many of his works adorned the Pan-American Exposition, several of which are celebrated for their excellent merit—"The Despotic Age" and the four "Spirits of Music" which ornamented the four facades of Music Hall. He also made the West Indies group on the settings to the Dewey Arch in New York city.

Mr. Konti has admirably succeeded in the model which he made for the American Radiator Company in bringing out the idea of the salutory importance to all buildings of the modern methods of warming. He represents the spirit of Comfort in a gracefully modeled figure as bringing a better order of things to all classes of occupied buildings. It is one of those allegorical studies which aims to tell a very comprehensive story of excellent motive in a condensed and very attractive pictorial description. It is very true to art—eliminating the mystic and fantastic—does not puzzle the beholder, but tells its story easily, plainly, very naturally—replete with light and interest, grace and harmony.

The words which have been modeled into the circlet in the upper left hand corner of the bas-relief summarize the whole field of motive and effects which are touched and demonstrated by this business: Art, Comfort, Pureness, Economy. These are the terms which represent in many sub-divided effects the better conditions which are permanently secured by property owners who invest their means in the products exhibited in our "Model Colonial Home" at St. Louis.

Heat Saved by Pipe Covering

It is estimated that bare steam pipes lose by radiation heat equal to two tons of coal a year for each ten square feet of surface of the pipe, with the steam at 100 pounds pressure, and a corresponding amount for lower pressures. Of this waste heat, 88 per cent. can be saved by using the best pipe covering.

"Don'ts" for Hot Water Fitters

Don't forget that hot water will flow up and then come down again after it has cooled.

Don't forget that air and water won't mix very well.

Don't try to hold air in the pipes when it wants to get out.

Don't forget that the hottest water is always at the top of the pipe.

Don't forget that it uses up energy to make water turn corners.

Don't forget that it is easier for water to go around two 45-degree turns, a foot apart, than to go around one ordinary elbow.

Don't forget that the last radiator on the line is the farthest from home and needs the tenderest care.

Don't forget that the further the radiator gets from the fire, the colder it is likely to be.

Don't forget that hot water will travel up the vertical pipe faster than it will through the mains in the cellar.

From Model Boiler Co.'s free library, copyrighted by the Whitman Co.

Directory of Societies

American Society of Heating and Ventilating Engineers. Secretary, W. M. Mackay, 235 Water street, New York. Annual convention, New York, Jan. 18-20, 1905.

American Society of Mechanical Engineers. Secretary, F. R. Hutton, 12 West 31st street, New York.

Association of Engineering Societies. Secretary, John C. Trautwine, Jr., 257 South Fourth street, Philadelphia, Pa.

Society for the Promotion of Engineering Education. Secretary, Prof. C. A. Waldo, Purdue University, Lafayette, Ind.

American Society for Testing Materials. Secretary, Prof. Edgar Marburg, University of Pennsylvania, Philadelphia, Pa.

American Institute of Electrical Engineers. Secretary, Ralph W. Pope, 95 Liberty street, New York.

National Association of Master Steam and Hot Water Fitters. Secretary, H. B. Gombers, 260 West Broadway, New York.

American Foundrymen's Association. Secretary, Richard Moldenke, P. O. Box 432, New York.

AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS

A meeting of the Board of Governors has been called for Septtember 16 to arrange for the annual meeting, to pass upon applications for membership and transact such other business as may come up.

Secretary Mackay already has about a dozen applications, and it is probable that a ballot will be sent out early in October.

Arrangements for the annual dinner next January have been made with the new Hotel Astor, and the use of College Hall in that building has been offered for the meeting of the Society.

TRADE AND MISCELLANEOUS NOTES

GEORGE F. CHALFANT, of Spang, Chalfant & Co., Pittsburg, Pa., died at Detroit, August 11, as the result of an accidental fall. Mr. Chalfant was 63 years old and was one of the pioneers in the pipe and iron business.

CENTRAL GEORGIA PLUMBING AND HEATING CO. started in business at Macon, Ga.

WESTERN OVERDRAFT HEATING CO., Rockford, Ill., has been incorporated by E. H. Bruce, M. A. Banks and F. S. Regan; capital stock, $10,000.

DAY & HOLT CO., Catskill, N. Y., succeed the firm of Day & Holt.

NILES PLUMBING & HEATING CO., Niles, O., has been incorporated by G. C. Davis, George H. Orcutt, Thomas M. Jones, Henry E. Davis and Frank R. Codwer; capital stock, $20,000.

HERBERT F. PETERSON is starting in the heating business at 2430 Cedar street, Philadelphia.

GEORGE M. FINK, Fostoria, O., succeeds the Perry Street Plumbing & Heating Co. and Stanley & Lawrence.

T. E. WALTERS PLUMBING & HEATING CO., Aurora, Ill., has been incorporated with a capital of $10,000.

PEKIN PLUMBING & HEATING CO., E. Court St., Pekin, Ill., is a new concern managed by W. H. Koehnle.

LARIMER HEATING & PLUMBING CO., Denver, Colo., has been incorporated with a capital stock of $7,500.

PROSPECT BOILER CO. is a new company incorporated at New Brunswick, N. J., with a capital of $100,000.

NEW YORK RADIATOR CO., Utica, N. Y., are adding to their East Utica plant a foundry 72 feet square.

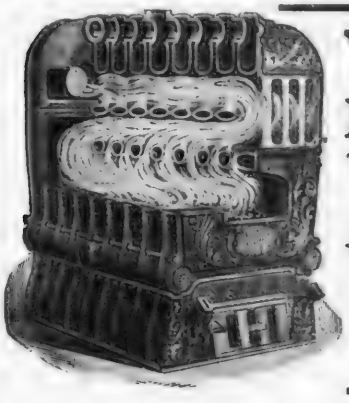
F. W. THEMES has started in the heating and plumbing business at Joliet, Illinois.

CHAS. W. WELLER, Framingham Center, Mass., succeeds J. H. Beatty.

KELLOGG - McCRUM - HOWELL CO. have their new offices at 48 East 20th street in very complete working order, and their very handsome showroom is approaching completion. It is a large room, richly carpeted and furnished and tastefully decorated. Their samples, which are rapidly being put in place, will show the full line of Richmond boilers, Acme radiators and Monarch enamel ware. These goods, as is well known, are manufactured at Norwich, Conn., Uniontown, Pa., and Blairsville, Pa., respectively, and for selling purposes brought together under one roof.

KIELEY & MUELLER, manufacturers of steam, air and water specialties, announce that they have finally been able to move into their new building, 34 W. 13th street, New York. They have one of the most thoroughly well constructed buildings in the city and have taken great pains with it. The wheels are going round now and they are ready to fill all orders.

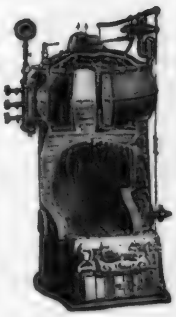
JOHN DUNCAN, the new vice-president of the Western Tube Co., Kewanee, Ill., has indicated an aggressive tendency in regard to New York business by opening an office in the Battery Park Bldg., in charge of Frantz Haverstock as sales agent and F. E. Olin, assistant.



WALKER BOILERS

GOOD BOILERS THAT'S ENOUGH

WALKER & PRATT MANUFACTURING COMPANY BOSTON, MASS.



CATALOGUES OF BOILERS and radiators are wanted by Mylander Hardware Co., Oak Harbor, Ohio.

AMERICAN RADIATOR, Chicago, declared a quarterly dividend of 1⅓ per cent. on their preferred stock, payable August 15.

AMERICAN RADIATOR CO., Chicago, have elected James B. Forgan, president of the First National Bank, as member of the board of directors to succeed the late William T. Baker.

FORTY TYPES of pumping machinery at the St. Louis Exposition are described and illustrated in a handsome pamphlet, 8½x12 inches, distributed by the International Steam Pump Co., of 114 Liberty street, New York. In this are included not only the many types of pumps exhibited, but also air-compressing and steam-condensing apparatus, cooling towers, vacuum machines, water meters, etc., etc. The processes in which these machines are employed on the Exposition grounds, such as timber preserving and refrigeration, are fully explained and diagrams and graphical charts are employed to illustrate the design and arrangement of apparatus. A striking view of the grand cascade is shown on the cover. This publication is distributed gratis.

SCHAEFFER & BUDENBERG, New York, have a most elaborate display in the Palace of Machinery at St. Louis. Mr. Portong presides in person over their exhibit of steam brass goods.

LUNKENHEIMER CO., Cincinnati, O., have a fine display at St. Louis of their line of valves, etc.

WALWORTH MFG. CO., Boston, have an exceptionally conspicuous exhibit at St. Louis. They show samples of pretty nearly all their extensive line, having samples arranged in a striking and attractive manner. The Hall tapping machine is on exhibition and is operated for the benefit of those interested.

PIPE MACHINES are shown by Borden Co., Warren, O.; Merrell Mfg. Co., Toledo, O., and Bignall & Keeler, Edwardsville, O.

KIELEY STEAM SPECIALTIES, well known to all men, are displayed by the Western Kieley Steam Specialty Co., Chicago.

PHILIP CAREY MFG. CO., Lockland, O., have a handsome exhibit of steam pipe and boiler coverings.

J. H. WILLIAMS & CO., Brooklyn, display their drop forgings and their celebrated line of pipe wrenches.

The Albany Return Steam Traps

have been the **STANDARD** for over **THIRTY-TWO YEARS.** For returning water under pressure to the boiler, they will perform this duty fully as well, and in many cases better than the so-called steam loop.

Send for circulars A, B, C and D.

MANUFACTURED BY

ALBANY STEAM TRAP CO., ALBANY, N.Y.

FREDERICK TOWNSEND, PRESIDENT — JAMES H. BLESSING, GEN. MGR.

KENT'S ENGINEER'S POCKET BOOK

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HEATING AND VENTILATING MAGAZINE

1123 Broadway, New York

PRIZER-PAINTER STOVE & HEATER CO., Reading, Pa., have opened a Philadelphia office under the management of William Brownback, formerly Philadelphia manager of the Kellogg-Richmond Co. The New York office will be under the management of W. S. Newkirk, who takes the place of Judson A. Goodrich, who lately resigned.

KELLOGG-McCRUM-HOWELL CO. have promoted Albert Pearson to the management of their Philadelphia office, in place of William Brownback, resigned.

KELLOGG - MACKAY - CAMERON CO., Chicago, have engaged George Waddington of Bloomington, Ill., to travel for them in the territory surrounding Bloomington.

George Wolfel, formerly in the office of the company, will hereafter travel for them in central Illinois.

INTERNATIONAL HEATER CO., Utica, N. Y., have sold the property of the Economy Furnace Co. to the Central Iron Works Co., of Syracuse, N. Y.

W. C. HIGGINS, the veteran boiler manufacturer, of late years manager of the boiler department of the Magee Furnace Co., Boston, has resigned his position. After a little rest he will again engage in his lifelong business of making and selling house heating boilers.

J. A. GOODRICH, well known to the heating trade for years, has engaged in another line of effort, having connected himself with the Livermore & Knight Co., Providence, R. I., the clever advertising experts. Mr. Goodrich ought to be able to talk up the Livermore & Knight goods as well as anybody because he is in the position of a doctor who takes his own medicine, having used the L. & K. advertising matter for years.

T. GUY HAYWOOD, lately of Norwich, Conn., well known for years in the heating business, returned a few weeks ago from France and has started for Seattle on some special business, which may keep him on the coast for a considerable time.

"HOT WATER PIPING" is the subject of Volume 65, of the Model Boiler Free Library, issued by the Model Heating Co., Philadelphia. Every heating contractor has somebody around his place who would learn something from the condensed information contained in this series of heating literature. Copies can be had on application to the Model Heating Co., Philadelphia, Pa.

"Sunrays" are pleasant in Winter

Why not use Sunrays in your business?

We will make it pleasant and profitable for you to use them.

The J. L. Mott Iron Works

84-90 Beekman St., New York

ROMAN RADIATORS and Sunray heaters are made by J. L. Mott Iron Works, New York, and a small catalogue illustrating and describing them is sent us by the manufacturers.

It shows the different styles of house heating boilers and tank heaters, and the different patterns and sizes of Roman radiators and pin and flue indirect radiators, also various other specialties. For further details, the manufacturers refer to their larger catalogue, which will be sent on application.

NORRISTOWN COVERING CO., Norristown, Pa., advise us that they are very busy and have plenty of orders for their excellent product.

SYRACUSE STOVE WORKS, Syracuse and New York, furnishing registers for nine school houses in Newark, N. J., the contractors being Storms & Co., and Elias Berla.

SYRACUSE STOVE WORKS, Syracuse and New York, furnishing solid bronze registers for new state house, Trenton, N. J. T. B. Cryer & Co., Newark, N. J., contractors.

INTERNATIONAL HEATER CO., Utica, N. Y., distribute a little desk blotter on which we are told "If it is to be heated, specify 'made by the International Heater Co.'"

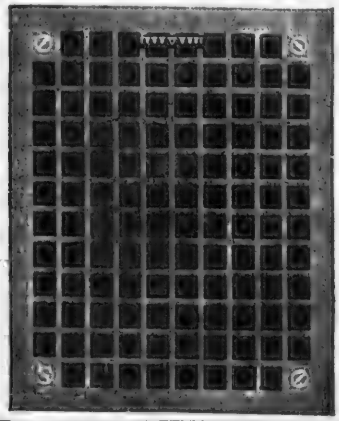
"VALVE TROUBLES AND HOW TO AVOID THEM" are described in a little book lately issued by Jenkins Bros. It gives valuable information to all users of valves and incidentally tells some things about the extensive Jenkins line.

A NEW PRICE LIST of Royal boilers has been issued by the Hart & Crouse Co., Utica, N. Y. It gives prices, dimensions and capacities of 38 styles and sizes, ranging in capacity from 210 to 7,500 square feet of steam and from 360 to 12,900 square feet of hot water radiation.

PHILIP CAREY MFG. CO., Lockland, O., issue a catalogue describing and illustrating their extensive line of pipe covering. They also illustrate several large power plants and office buildings equipped with their covering.

A NEW Plumbing, Heating and Lighting Directory for 1905 is now being compiled by the Plumbing and Heating Publishing Co., and will contain the names and addresses of manufacturers and jobbers of plumbing, heating, lighting and steam supplies, also of all master plumbers and master steam and hot water fitters of the United States and Canada.

It will also contain a classified list, alphabetically arranged, of goods manufactured, and the trade names of closets, bathtubs, heating boilers, etc., arranged so



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that buyers and others can get the information desired at once.

The size of the book is 8x6 inches, being convenient to handle and a desirable size for advertising, rates for which can be had from the publishers. The price per copy is $5.00 and orders are coming in from jobbers, master plumbers, fitters and others in the United States and Canada.

The publishers request any firms having the printed information sheets sent them to fill them out and return them soon. Those not receiving sheets can get them on application to the Plumbing and Heating Publishing Co., 6074 Metropolitan Building, New York city.

SPECIFICATION AND CONTRACT blanks for steam heating apparatus constitutes the 19th number of Model Noiler Shop Practice, issued by the Model Heating Co., Philadelphia, for the particular benefit of the working force. Any heating contractor who has not received this blank ought to send for it.

A GOOD RULE—a folding rule five feet long—is received from the Reading Stove Works, Orr Painter & Co., Reading, Pa. The imprint says, "It is a good rule to always buy Sunray heaters." Manager Beard has a few more left and perhaps he can be persuaded to separate himself from some of them. It is worth trying.

"HOME COMFORT" is the legend neatly embossed upon the rough brown paper cover of the latest booklet of the Powers Regulator Co., Chicago and New York. The book is devoted to a concise description of the Powers Regulator and its application to various kinds of heating apparatus. There are illustrations of the various devices, separately, and in their application to heating systems. One page is devoted to dampers and contains suggestions that should be of value to many manufacturers of house heating boilers.

BLAKE & ANDROS, 28 Portland street, have issued a new catalogue of their boilers, in the course of which they state that they have abandoned the assertion that their boilers are the most economical, most durable, etc., for the reason that every other boiler claims exactly the same thing, and they simply state that their "Crescent hot water heaters, with proper care, will last as long as you need artificial heat, and that is long enough."

GURNEY HEATER MFG. CO., 74 Franklin street, Boston, have got out a new book describing all their steam and hot water heaters. An accompanying letter refers to the larger and deeper firepots and larger fire and clinker doors.

Hub Heating Apparatus

SUPERIOR IN DESIGN, CONSTRUCTION AND EFFICIENCY

Manufactured and Warranted by

SMITH & ANTHONY COMPANY, BOSTON

SHIRLEY RADIATOR & FOUNDRY CO., Shirley, Ind., enclose with their mail a small sheet showing five different heights of their three column Shirley radiator, on the back of which is list of dimensions and prices.

BEATON & CORBIN MFG. CO., Southington, Conn., send out a circular descriptive of their floor and ceiling plates, under the patents of A. J. Beaton, A. H. Muus and A. R. Wells. These are the excellent plates well known to the trade.

W. VA. HEATING AND PLUMBING CO., Charleston, W. Va., issue a book with handsome engravings of important buildings fitted up by this company with heating apparatus. There is also much in the contents of interest to any one concerned with heating matters.

WARREN WEBSTER & CO., Camden, N. J., have issued a very comprehensive and handsome catalogue called "Exhaust Steam Utilized to Effect Economy or Increase of Power and How!" It is divided off into sections, each section dealing with a separate subject. The first section deals with the Webster "Star Vacuum" feed water heater and purifiers in general. The chief contents of this portion are: Descriptions of feed water heaters, good, better and best; some figures and results; loss due to back pressure; complete descriptions and illustrations of the "Star Vacuum" feed water heater and purifier, and its parts; some testimonials. The second section describes the Webster system of steam circulation for heating purposes at or below the pressure of the atmosphere. The description is most complete and very interesting. This section is ended with 35 pages of illustration of building where this system of circulation is used. The general work on this catalogue is high-class, both the illustrating and typographical. The style of the catalogue is very neat and attractive, and is also quite unique in some respects.

Heating Contracts

HOPSON & CHAPIN MFG. CO., New London, Conn., heating residence, Mrs. Weber, Stamford, Conn.

JAEHNIG & PEOPLES, Newark, N. J., heating residence, Chas. L. Watter, Grafton and Clifton avenues, Newark.

A. J. SIMPSON, Newark, N. J., heating police station, Orange and N. Sixth streets, Newark.

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SAVES Time, Labor, Coal.

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RAISLER HEATING CO., 17 E. Twenty-second street, New York, heating studios, S. Solomon, 970 Sixth avenue, New York.

WM. VAIL, Tuxedo Park, N. Y., heating residence, H. C. Pell, Tuxedo Park.

SAYLES CO., 446 Fourth avenue, New York, heating library, Kingsbridge avenue, Kingsbridge, N. Y.

ROSSMAN & BRACKEN, 132 East Forty-second street, New York, heating hospital, Front and Water streets, New York.

A. J. ROGERS CO., Paterson, N. J., heating mercantile building for estate of Samuel Smith, Market street, Paterson.

BLAKE & WILLIAMS, 211 W. Twentieth street, New York, heating Isolation Hospital, Belleville, N. J.

J. W. DOUGHERTY, Poughkeepsie, N. Y., heating office building, J. W. Dale, Union and Main streets, Poughkeepsie.

J. W. PLASS, Poughkeepsie, N. Y., heating residence, G. W. Cauldwell, Market and Noxen streets, Poughkeepsie.

JNO. HANKIN & BRO., New York, heating restaurant, Geo. A. Hazeltine, 41 Broad street.

BAKER, SMITH & CO., 84 W. Houston street, New York, heating parish house, Harrison and Clinton streets, Brooklyn; heating stable, M. C. Lefferts, Cedarhurst, L. I.; heating residence, 4 W. Fifty-eighth street, New York; heating residence, 18 E. Sixty-eighth street, New York; heating residence, 39 W. Fifty-third street, New York; heating residence, 24 E. Thirty-ninth street, New York; heating office building "Trinity Building," 111 Broadway, New York; heating stable, Jos. Henry Smith, 124 W. Fifty-sixth street, New York; heating residence, 42 E. Fifty-second street, New York; heating University Cottage Club, Princeton, L. I.

GILLIS & GEOGHEGAN, 539 W. Broadway, New York, heating residence, 854 Fifth avenue, New York; heating stable, John H. Huyler, 17 W. Sixty-seventh street, New York; heating convent and laundry, R. C. Church of Holy Trinity, 345 W. Waterbury street, Brooklyn, N. Y.; heating nursery, Sisters of Mercy, 185 E. Twelfth avenue, Brooklyn, N. Y.; heating bank and office building, 63 Pine street, New York.

L. G. KIRK, 419 Lexington avenue, New York, heating loft building, Park place and Broadway, New York; heating flat, Robert M. Silverman, 101st street and Manhattan avenue, New York; heating loft building, 35 Ferry street, New York.

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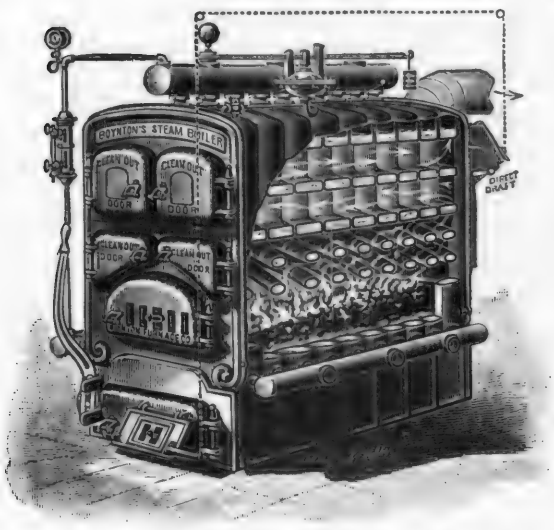

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M. J. OLVANY, 98 Charles street, New York, heating police prison and stable, Bath avenue and Bay Twenty-second street, Brooklyn.

CARTHY & DUNBECK, Salt Lake City, Utah, heating school by steam.

GREEN & REEVE CO., Salt Lake City, Utah, overhauling steam plant in Mormon temple.

F. P. MERKEL, Newark, N. J., heating double flat, Mrs. Maria Harth, 297 S. Orange avenue.

LESLIE WHITE, 50 S. Washington square, New York, heating flat, Samuel Greenwald, 21-25 E. 110th street.

E. E. FAITH, Nutley, N. J., heating residence, W. C. Gibson.

JNO. COLLINS, Passaic, N. J., heating residence, Wm. C. Gibson.

FRANCIS BROS. & JELLETT, 47 E. Eighteenth street, New York, heating

HIGHAM, BURTON & TAYLOR, Salt Lake City, Utah, heating court house at Coalville, Utah.

H. B. LENTZ, Fifth and Potlash street, Philadelphia, heating residence of Hyman Linn.

EDWARD F. ROBERTS, Twenty-Fifth street and Columbia avenue, Philadelphia, heating building for George Walker, Twenty-ninth street.

CHARLES A. RILEY, Broad and Cumberland streets, Philadelphia, Pa., heating building for David Magee.

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W. M. ANDERSON, Twentieth and Chestnut streets, Philadelphia, heating with hot water building at 120 North Seventeenth street.

T. C. F. TRACHSEL, 230 Arch street, Philadelphia, heating residence of W. C. Garrett, 3404 Baring street.

JAMES J. MILES, Broadway, Rensselaer, N. Y., heating high school.

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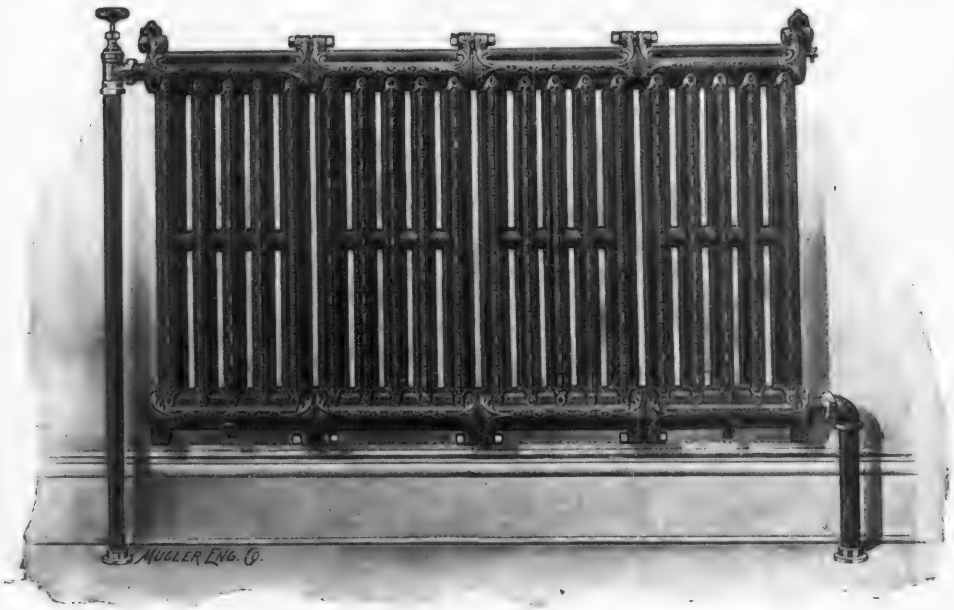

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J. F. HANLEY & CO., Newark, N. J., heating and plumbing apartment, Ph. J. and Thos. F. Bowers, 32 Gillette place, Newark, N. J.

HAYS & KIERSTED, Montclair, N. J., heating residence, Dr. Seymour Boughton, Brookdale, N. J.

FULLER & WARREN CO., 1135 Broadway, New York, heating public school, Leonia, N. J.

STORMS & CO., Newark, N. J., heating school, Thirteenth ward.

ISAAC A. STORMS, Paterson, N. J., heating residence, Lewis C. Baer, 65 E. Fifteenth street, Paterson, N. J.

BLAKE & WILLIAMS, 211 W. Twentieth street, New York, heating residence, Mrs. L. C. Abercrombie, Ballantine Parkway and Clifton avenues, Newark, N. J.

RAISLER HEATING CO., 17 E. Twenty-second street, New York, heating flat, 250 E. Fifty-third street, New York.

GEORGE H. CHANNELL, Rutland, Vt., heating the Mead House.

GEORGE H. McLEAN, Springfield, Mass., heating railroad Y. M. C. A. Building.

BAKER, SMITH & CO., New York, heating Trinity Building, Broadway and Trinity square, N. Y.

WELLS & NEWTON CO., Avenue C and Seventeenth street, New York, heating and ventilating Dr. Parkhurst's new church, Madison square.

MERWINE BROTHERS, Seventh and Walnut streets, Philadelphia, heating by hot water the residence of Wm. Clapp on Forty-third street.

BROWN & BOWEN & CO., Builders' Exchange, Philadelphia, heating by steam, St. Mary's Parish House.

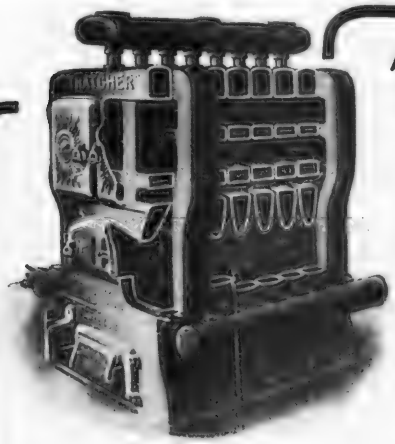
NEWTON & GRAY, Thirteenth and Sansom streets, Philadelphia, heating by hot water building of Western Soup Association.

LOUIS MANNER, Seventeenth and Chestnut streets, Philadelphia, heating by hot water residence of Dr. B. F. Stahl.

J. W. CUFF & CO., Twenty-third and Fountain streets, Philadelphia, heating School of Design.

TRIMBLE & LUTZ, Wheeling, W. Va., heating court house, jail and sheriff's house, St. Clairesville, W. Va.

MULLIGAN & SCHERMERHORN, Troy, N. Y., heating the Mansion House.



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L. TIVY, 13 Platt street, New York, heating flat, Gustav Lauer, 163d street and Trinity avenue, Bronx.

A. L. HENRY, Nyack, N. Y., heating the Nyack Hospital.

LEWIS W. BUTTERFIELD, Orange, N. J., heating Orange M. E. church; heating residence, Mrs. A. R. Halstead, 67 Taylor Place, South Orange.

HENRY SHAFER, Carmel, Ill., heating residence of John Ingles.

ROEBUCK & BROWN, Mattoon, Ill., heating public school.

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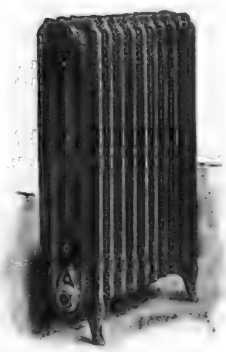

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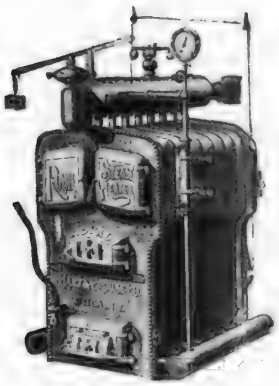

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H. I. ADAMS & CO., 205 Dennis street, Seattle, Wash., heating commercial block at Aberdeen.

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G. A. SUTER, 108-112 Wooster street, New York, heating Harmony Club.

CHARLES W. BARNETT, 118 W. 26th street, New York, heating apartment house, 647 Madison avenue.

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HENRY EWINGER PLUMBING & HEATING CO., Burlington, Ia., heating Sunnyside school.

H. E. MULLER, 173 Concord street, Brooklyn, N. Y., heating residence of Dr. Vanatten, Tremont, N. Y.

LARKIN & CO., Pittsfield, Mass., steam heating Riverside Inn, Chester.

J. BUCHANAN & CO., Philadelphia, heating and ventilating new country house, Camden, N. J.

C. A. BRISTOL, Oak Field, Wis., remodeling heating plant in High School.

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